# Mining CONGRESS JOURNAL

AMERICAN MINING CONGRESS

APRIL 1950

*Featuring—*

**27th Annual Coal Convention**

# TWO MILES IN ONE FLIGHT!

Here coal is prepared in this new blending and washing plant completely designed and built by Link-Belt. From this plant the washed coal is delivered to the tunnel belt conveyor (right side of above photograph) on which it is transported to the river and rail loading station.

River and rail loading station also built by Link-Belt Company where washed coal is loaded into barges, or by means of a by-pass conveyor, into railroad cars.

## World's Longest Single Belt Conveyor

Through a mountain, under forests, roads and streams this single 30" wide belt conveyor transports coal from preparation plant to river and rail loading station—10,900 ft. from foot pulley to head pulley—more than four miles of belt operated by one drive!

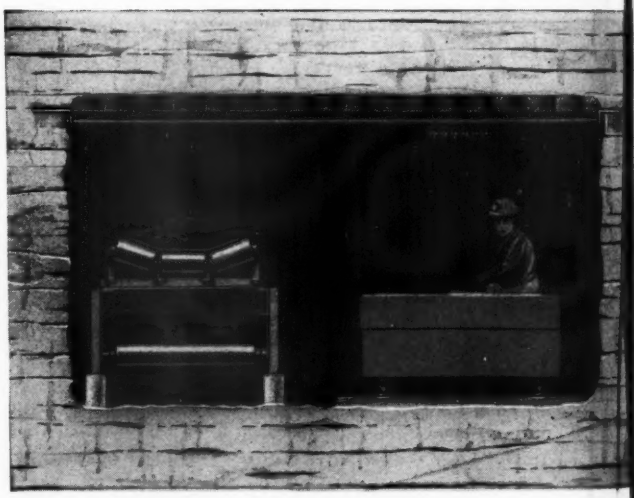
After careful analysis of various methods of transportation ultimate economy dictated the selection of this belt conveyor. By building this conveyor in one flight, intermediate transfers, heavy machinery and power wiring were eliminated from the tunnel.

Link-Belt Company engineered, equipped and erected the blending and washing plants, the conveyor equipment and the river and rail loading station. Resulting success of this and other similar projects illustrates the importance of such coordinated effort.

11,844

**LINK-BELT COMPANY**

Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington 9, W. Va., Louisville 2, Denver 2, Kansas City 8, Mo., Cleveland 15, Indianapolis 6, Detroit 4, Birmingham 3, St. Louis 1, Seattle 4, Toronto 8, Johannesburg.



Typical cross-section through tunnel showing belt conveyor and battery driven patrol car. Standard Link-Belt type "100" idlers are used throughout the 2-mile long belt conveyor.

**COAL PREPARATION AND HANDLING EQUIPMENT**

**Engineered and Built by LINK-BELT**

## POWER plus SPEED to load any materials and do it Consistently

The powerful "Automat" shovel loading head exerts a lifting force on its forward lip of 1,500 to 2,000 pounds, giving it tremendous digging, lifting and pulling ability to dislodge and load extra heavy and "tight" materials.

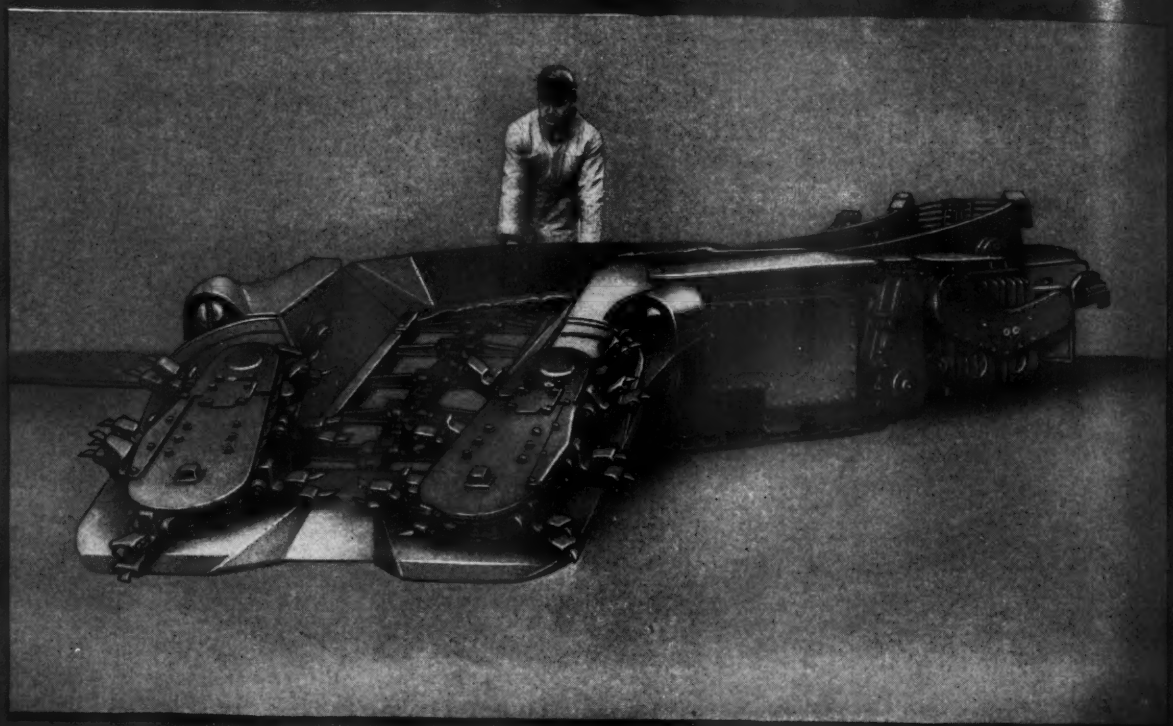
With its 47 inch wide shovel head working at 45 to 50 strokes a minute, you get speed and big capacity for the rugged job of handling any kind of materials you put the "Automat" to loading.

For complete information write Myers-Whaley Co., Knoxville, Tenn.

# MYERS-WHALEY

"MECHANICAL LOADERS EXCLUSIVELY FOR OVER 40 YEARS"

# GOODMAN
# TRACTOR TREAD LOADERS
## TYPE 660



**LOW HEIGHT**—93 inches over-all, 22 inches at coal line.

**HIGH CAPACITY**—rated at 8 to 10 tons per minute in free loading coal.

**SWINGING LOADING HEAD**—cleans up 18 foot path with only forward and backward maneuvering, loads around timbers and curves.

**ACCESSIBILITY**—all working parts enclosed, yet all are accessible for inspection or repair.

**LOW MAINTENANCE**—a rugged loader for continuous, heavy duty service. Best materials—from top to bottom, and to end—plus expert workmanship, are your guarantee of minimum upkeep expense.

GOODMAN MANUFACTURING COMPANY

HALSTED STREET AT

# GOODMAN
# SHUTTLECARS
## TYPE 570

- Adjustable height discharge conveyor, hydraulically controlled.
- Four wheel drive, two traction motors.
- Four wheel steer, mechanical with hydraulic booster.
- Four wheel brakes, hydraulic, self-retentive type.
- Hydraulically driven cable reel.
- Over-all height 48", capacity 210 cu. ft., water level full. With 6 inch side boards, height is increased to 54", capacity to 280 cu. ft., water level full.

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Top-suction also eliminates one of the most common causes of pump failure—breaking of the pump shaft seal because of water pressure. *Top-suction* keeps all dirt and water away from the oil seal, bearings and air motor—actually pulls lubricant into the seal.

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*Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress*

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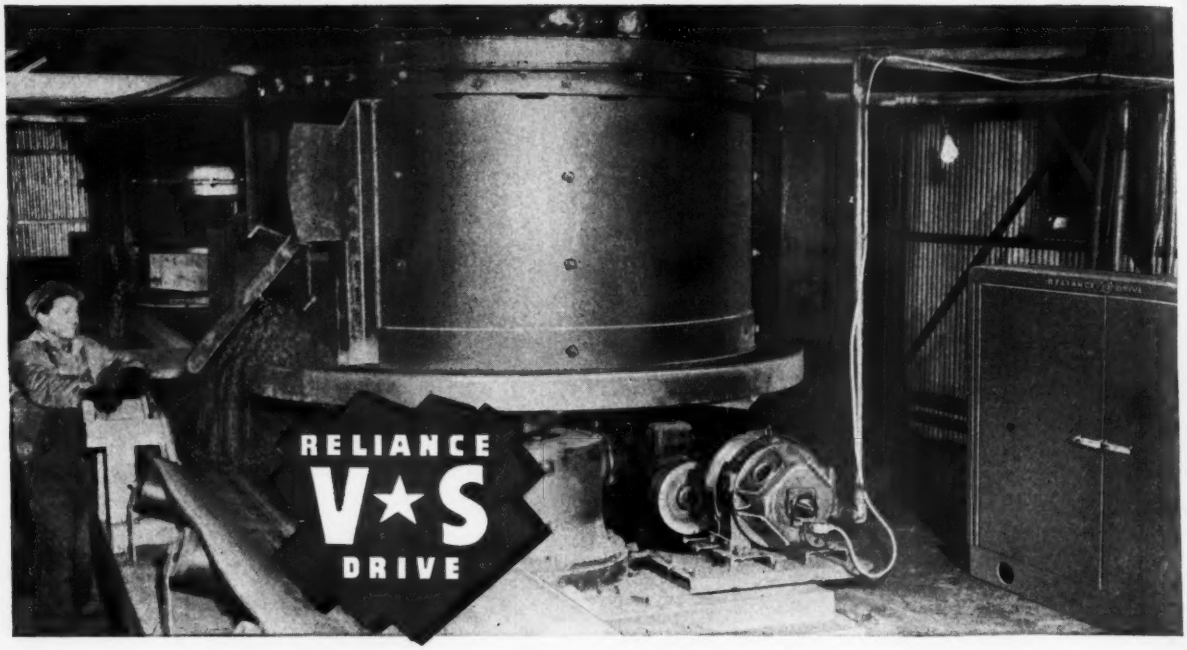


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Mining is another industry which profitably employs Reliance V★S Drive. Behind the steadily increasing use of this versatile drive, introduced over 11 years ago, stands a simple explanation: *It is one of the surest ways to increase production and lower operating costs!*

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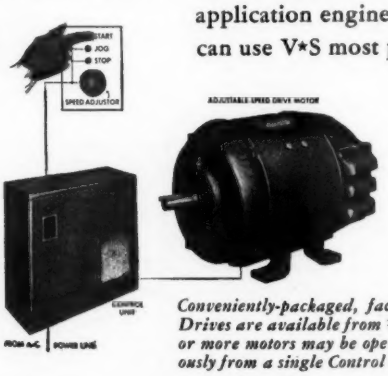


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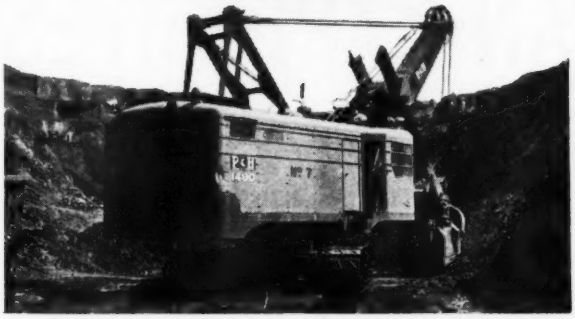
# WITH P&H COSTS ARE DOWN! ELECTRIC SHOVELS . . .



. . . at the Steep Rock Iron Mines in Canada. Here, the first P&H Model 1400 (4 cu. yds.) was quickly followed by two more.

Bigger tonnage at lower cost . . . that's the real test. And there's where you'll find the P&H 1400 leads the way with such features as the Magnetorque* which electro-magnetically powers the hoisting motions . . . *smoother, faster,* and more *dependably.* Quicker move-ups by independent propel add *more* tonnage. Stepless electrical control saves time by eliminating *all* contactor troubles. These and many other P&H features combine to give you increased production. Greater production means greater profits for you. Write, today, for information.

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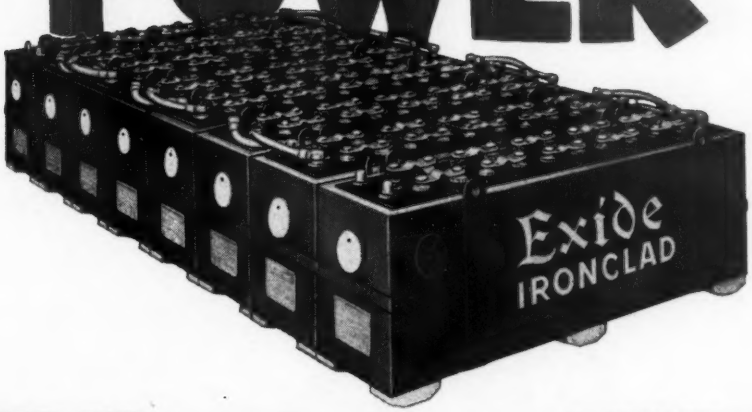


## SPEED UP your haulage and SAVE with EXIDE-IRONCLAD POWER

With Exide-Ironclads in your battery-powered shuttle cars, locomotives and trammers, you get all these time-saving, cost-cutting, tonnage-boosting benefits...

- instant starting and fast acceleration.
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In the past, training a mine-track crew has often been slow, expensive business. But many of the delays and complications have been eliminated in mines using Bethlehem prefabricated trackwork. Putting it together is so simple that almost anyone can get the hang of it in no time.

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These are a few of the reasons why a Bethlehem layout is easy to handle and install; why crews "catch on" so quickly. For more details, call or write the Bethlehem office nearest you. One of our engineers—a specialist in track—will gladly give you the full story and make any desired recommendations.

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# BETHLEHEM PREFABRICATED TRACK

# Here's How

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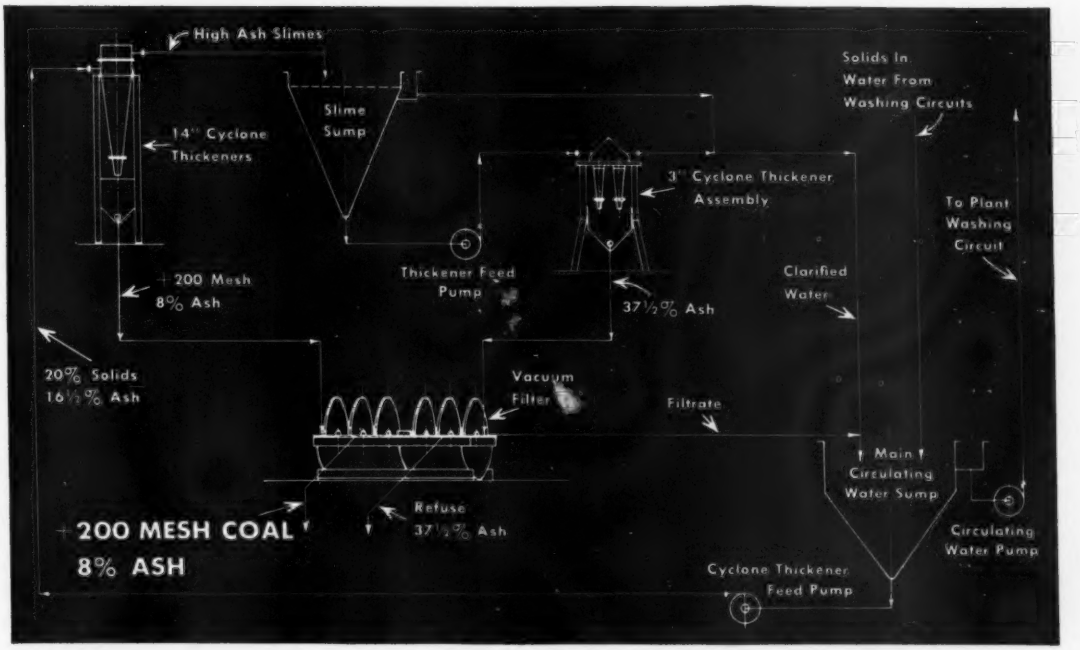


## The *Heyl & Patterson* CYCLONE THICKENER Will:

1. Permit closed circuit operation.
2. Prevent stream contamination.
3. Conserve water.
4. Clarify circulating water.
5. Recover marketable fine coal.
6. Enable Mechanical Dryers to provide lower moisture product.
7. Classify at any desired size-range, separating wanted from unwanted materials.

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"SINCE 1887"

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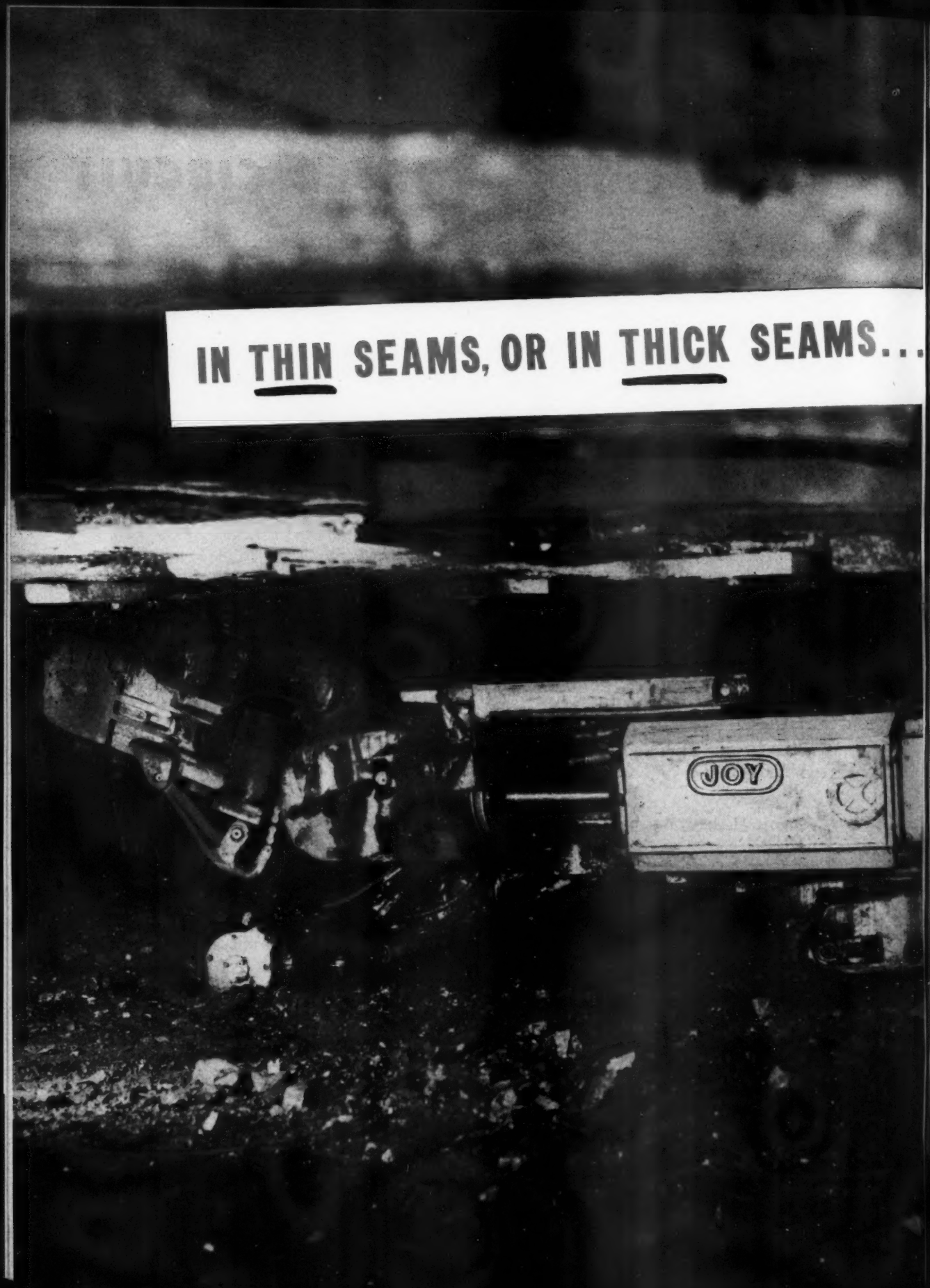
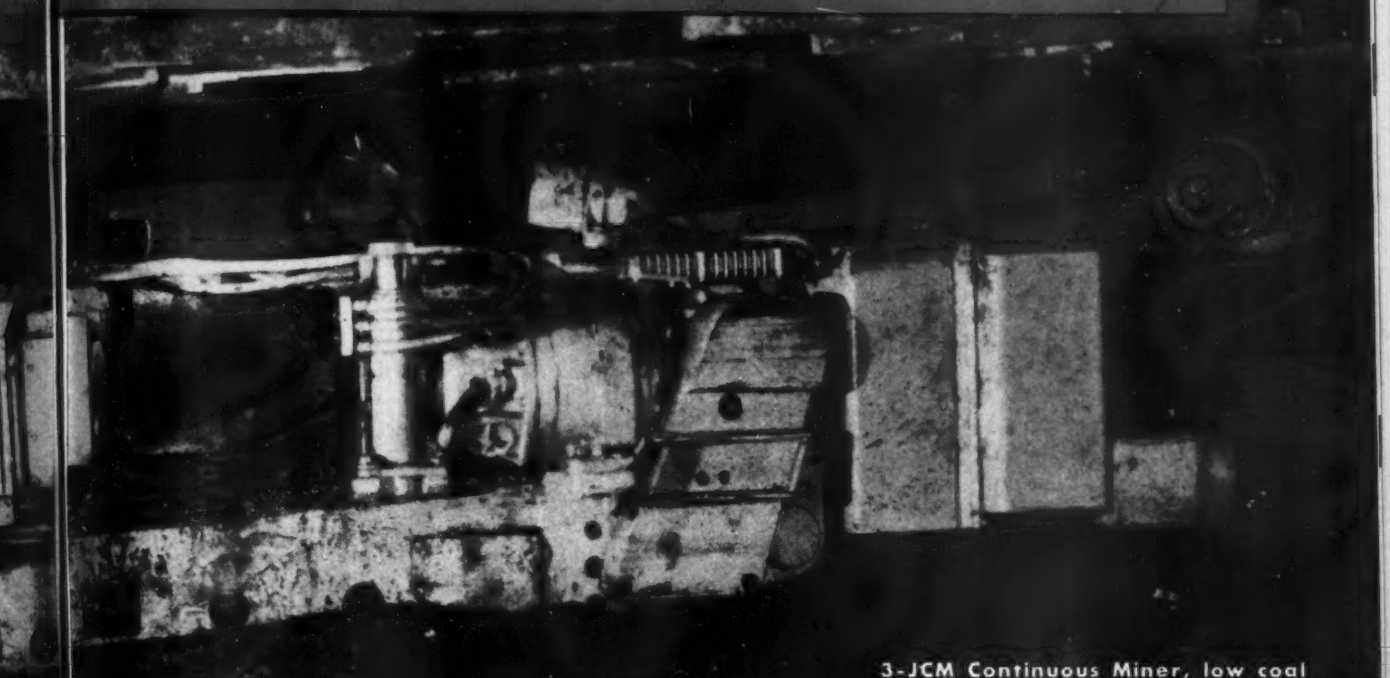

IN THIN SEAMS, OR IN THICK SEAMS...
JOY

# The JOY CONTINUOUS MINER

## marks a new era of Efficiency and Low Cost in Coal Mining



3-JCM Continuous Miner, low coal type, at work in the Gorgas Mine of the Alabama Power Co., Gorgas, Ala.

*Consult a Joy Engineer*

W&D CL3

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All this is the result of the high separating efficiency of the Chance Process . . . its dependable performance . . . high capacity . . . flexibility . . . low operating and maintenance costs.

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When stripping means ripping away rocks to get at the pay, the New International TD-24 is the choice of cost-conscious strip miners. This "Champion of Crawlers" puts twenty tons of toughness to work *twenty-four* hours a day in a Hawthorne, Pa., strip mine. Teamed up with another TD-24 and an International TD-18, the big "Champion" pushes five yards of shale at a time, according to its operator. The tractors work 'round the clock, taking time out only for lubrication. Six months of this rugged life has not slowed up the mighty "Champion." Only ordinary maintenance has been necessary.

Your International Industrial Power Distributor is waiting to give you positive proof of the power and performance of the International TD-24. Pay him a visit and get a new experience — a TD-24 demonstration. See how the amazing features of the TD-24 put it in a class by itself as the unchallenged "Champion of Crawlers."

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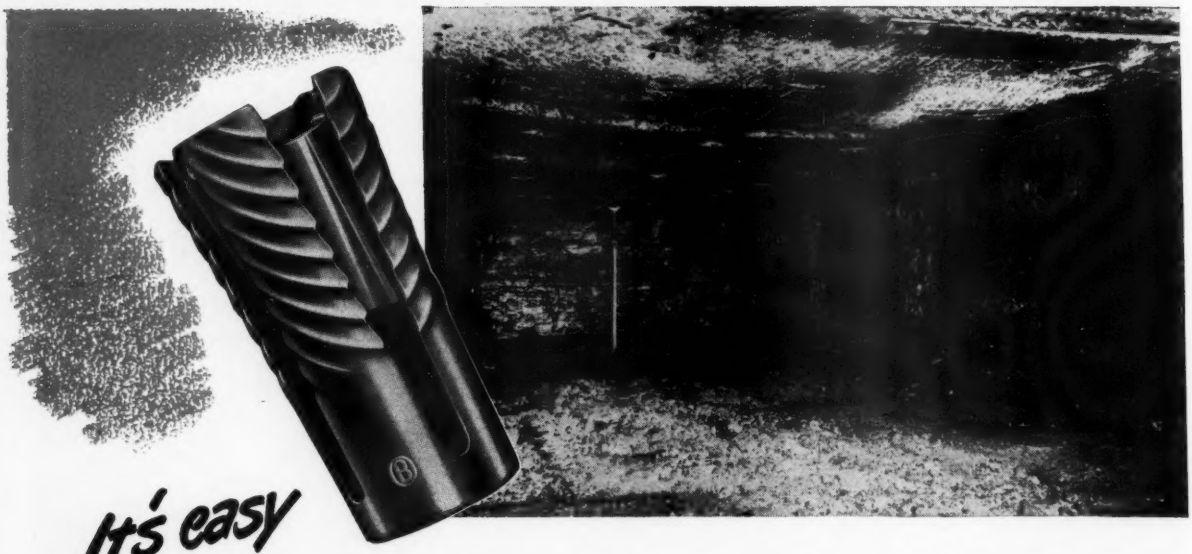

*It's easy to use*

# O-B ROOF SUPPORT EXPANSION SHELLS AND PLUGS

● O-B Roof Support Expansion Shells and Plugs provide an easy way for rapid and secure roof bolting, because they're especially designed for the job. If you are bolting to keep your roof in tip-top shape, you'll want to know how O-B Roof Support Expansion Shells and Plugs measure up for convenience, speed and dependability.

## CONVENIENCE

Proper pre-expansion is established at the factory when the shell is driven onto the plug. This also assembles the shell and plug into an easy-to-handle unit to be turned onto the bolt later at the mine.

## SPEED

See how you can do a good job—swiftly! With a few turns of the wrist and a sharp rap on the bottom, the plug is on the bolt and the shell rests on its support (Palnut, upset ear, etc.) ready to go up into the hole. (Rapping the bolt head on the floor separates the shell from the plug. Then the shell prongs are free to spring in to conform with the hole diameter.)

## DEPENDABILITY

Of course you want good roof! If you are using bolting to get it, remember this about O-B Expansion Shells and Plugs:

Properly installed in right-size holes, O-B Expansion Shells and Plugs will develop the full tensile strength of the bolt.

• • •

You can get more information on roof bolting. O-B field tests and observations, as well as clear illustrations of bolting procedure, are printed in our Bulletin No. 864-M. Use the coupon to get your copy.

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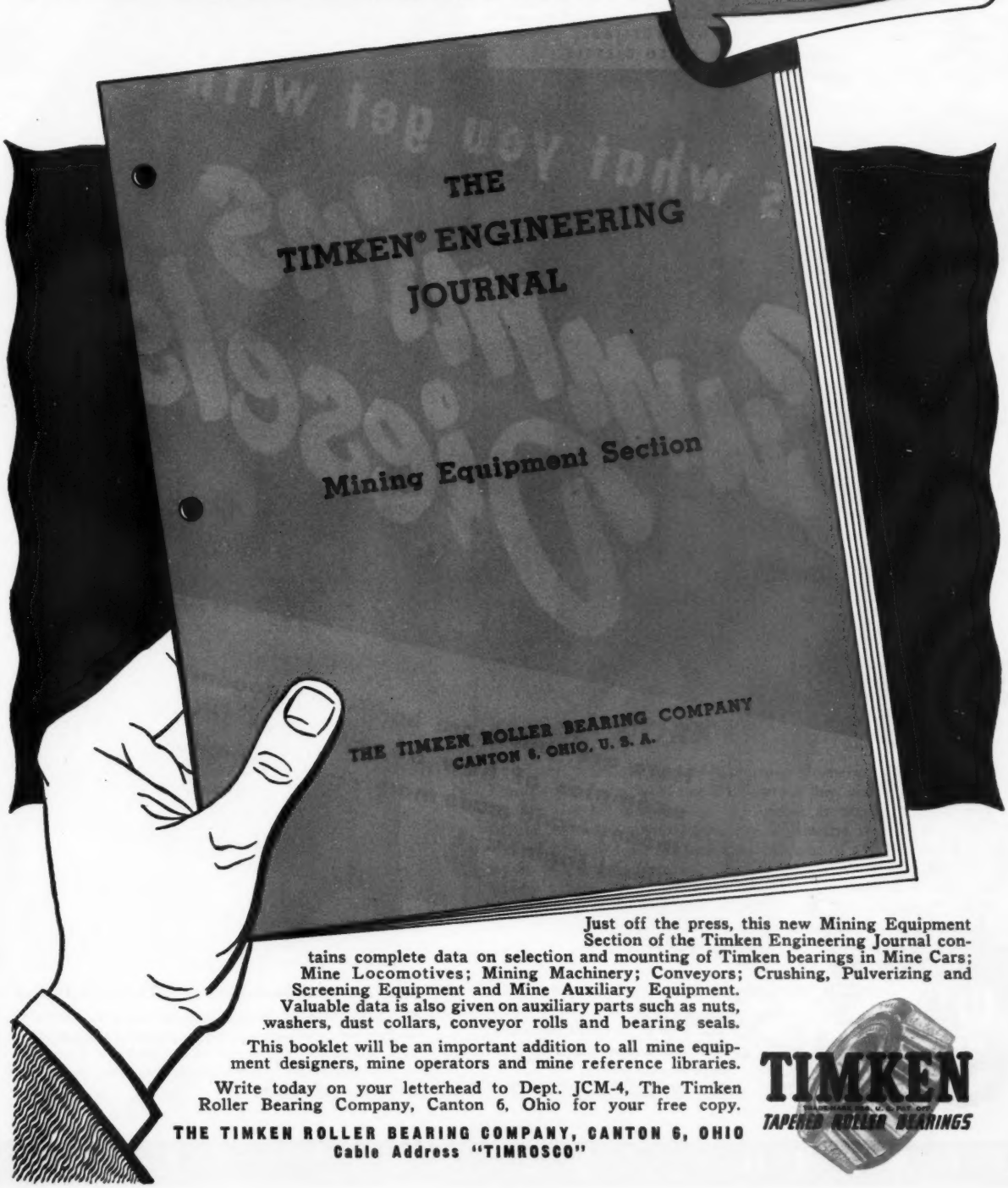


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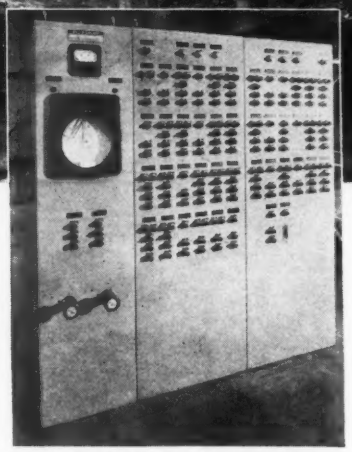

Control Panel which acts as "nerve center" for many of the automatic and semi-automatic operations at the Hendrix Mine plant.—Entire control layout by Roberts and Schaefer Company; manufactured by Westinghouse Electric & Manufacturing Company. Photographs: Torkel Korling.

This modern *pushbutton* preparation plant, constructed at the Hendrix Mine of the Consolidation Coal Company (Ky.), division of Pittsburgh Consolidation Coal Company, near Jenkins, Kentucky, is typical of all Roberts and Schaefer profit-producing plants. It's typical because of its functional design and the operating efficiency of its automatic and semi-automatic equipment.

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# Editorials

SHELDON P. WIMPFEN, *Editor*

April, 1950

## Coal Looks Forward

SETTLEMENT of the protracted coal strike on March 5 was reached on the very doorstep of national catastrophe. Management and the Union reached a compromise on wages and other demands and industry was restored the right to run its own properties. Both parties agreed to concessions rather than run the real risk of Government seizure and the ultimate hazard of Federal operation.

During and since the wage negotiations there has been some confused talk about coal mining being a "sick" industry. In the face of the actual facts, such a description is ill-founded and erroneous. Let's look at the record.

The normal average production of this so-called "sick" industry is more than 2,000,000 tons of coal a day—the greatest material-handling job in the world. During the war years this industry met the unprecedented demands for war production and civilian needs without government help or subsidy. It overcame all the obstacles created by the heavy withdrawals of experienced men and the necessity of maintaining production with worn out equipment, and never faltered in its service to the Nation.

Since the war, the industry has spent hundreds of millions of dollars for new and revolutionary mining machinery to keep coal production costs at a competitive market level with other fuels in the face of continually increasing labor demands. This so-called "sick" industry has steadily increased the output per man day to the point that an American miner produces from three to six times more coal than the miners in foreign countries. Ever alert to possible market expansion and new uses for its product, the industry has undertaken huge research programs looking to the conversion of coal to premium liquid fuels, the development of the coal-burning gas turbine, and other major advances.

The average weekly earnings of the coal miner are higher than those of any other industrial worker in the world. Safety in coal mining has made tremendous strides, with all-time low injury rates achieved in 1949. Working conditions have been vastly improved.

These accomplishments are part of the record of a *vigorous and virile industry*—one that is of basic importance to the industrial economy under which we live. Barring unforeseen development of atomic or other sources of energy for everyday use, coal mining is an industry that will be thriving when oil from the ground and natural gas are primarily of historical importance.

But we are mainly concerned today with the present problems of coal mining and the means whereby the industry may maintain itself as a vigorous and efficient segment of our economy in the immediate future. For this purpose there is no need to impose an investigating commission on the industry. The problems that do exist have been inflicted under the guise of benefiting UMWA membership.

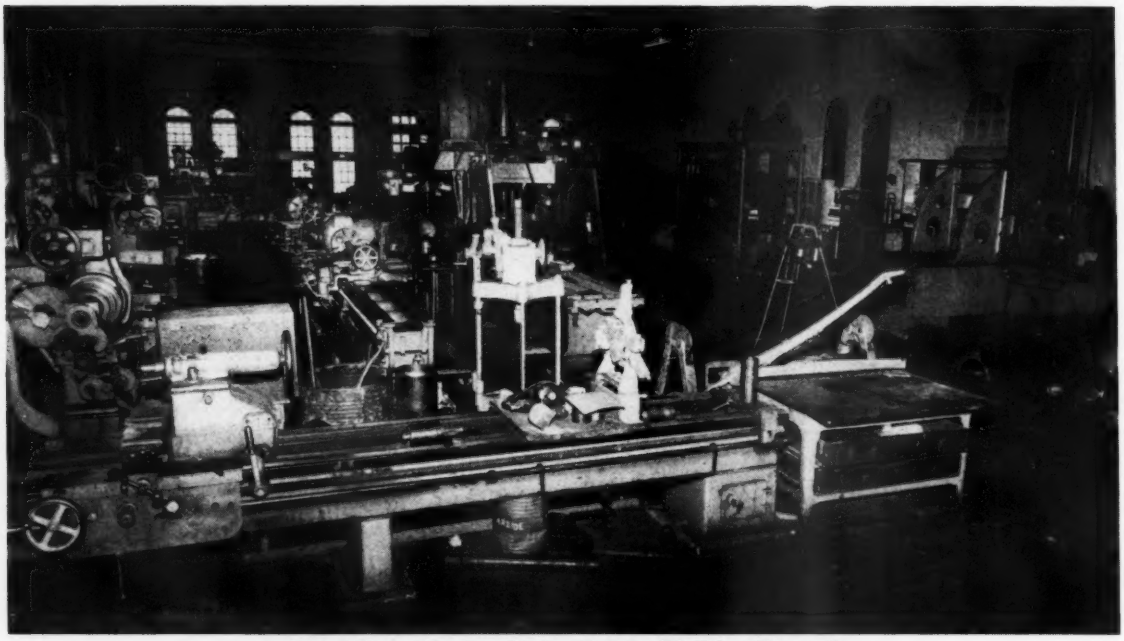
Following the negotiation of the present wage contract, George H. Love, president of the Pittsburgh Consolidation Coal Company, outlined four approaches to the problem of a sound and stable coal industry when he asked: "(1) The Government for legitimate help against imported oil but no subsidy or regulation for coal; treatment under tax depletion allowances equal to that of oil and gas; and that it enforce the Federal laws, whatever they may be, against all parties.

"(2) The Union to carry out this contract in good faith, continue to cooperate with the operators in producing more tons per man, and to limit its future demands to those which will actually benefit the miners in total employment and earnings.

"(3) The operators to continue to improve their plants and facilities so that coal may regain some of its lost markets and stand united against future unreasonable demands of the Union on one hand and Government regulation on the other.

"(4) The consumers to buy their coal as cheaply as possible, value considered, but not to exploit this important natural resource industry, and to limit their purchases to producers who are in this business not for a day, but are in it to make coal mining a better industry throughout the years."

These four measures will keep the coal industry on the road of steady advancement under our private enterprise system. If the Government, the miners, the operators and the consumers will aggressively follow this program, coal will achieve stability, regain lost markets and establish itself on a firm foundation as our most important basic source of energy.



Central Shop of the Consolidation Coal Co. (W. Va) at Monongah

# Maintenance of Coal Mining Equipment

## How an Efficient Organization Functions to Keep All Machinery Operating With Minimum Delays to Production

By GEORGE L. JUDY

Assistant Superintendent of Maintenance
Consolidation Coal Company (W. Va.)

NOT too many years ago, about the only tools necessary to do maintenance around a coal mine were a sledge hammer and a cold chisel. This is far from true today—mines are becoming highly mechanized. The machine mechanisms are complicated and are made to a high degree of accuracy. It is necessary to hold tolerances on all bearings and machine fits. Because of the changes in equipment, we must also change maintenance. Maintenance supervisors must be technically skilled and able to keep up with improvements and the rapid changes in design. They must be good electrical men with a thorough understanding of electricity and its functions; and above all, they must be able to understand men, train them and properly supervise them.

Sometimes a management that goes all out for top-flight production supervisors is satisfied with second-rate maintenance supervisors. Cost is usually blamed for such frugality. Management must learn to look at the greater losses resulting from poorly organized maintenance. A proper cost balance is needed, but it cannot be done without good organization. Following is a suggestion for what might be a successful maintenance organization; especially for a company made up of several mines in one locality and working through a central shop for major jobs.

### Suggested Maintenance Organization

(1) The maintenance head reports to top management. He may be classified as a maintenance superintendent, or a maintenance engineer. His department should have equal standing in the organization with production. Top management makes the decisions when production and maintenance differ.

(2) The maintenance head is advised by staff specialists on mechanical, electrical and special problems that one man cannot hope to cover. Draftsmen help in preparing workings and specifications.

(3) Craft specialization is beginning to enter the picture. This is brought about by the increasingly complex mechanization of industry. Some companies employ specialists for maintenance on electronic apparatus, motor controls and the like.

(4) A competent staff of clerks

A modern supply house is kept in good order and is well stocked

handle routine administrative duties, such as dispatching, cost records, equipment records and executive reports. This frees the maintenance head for more effective supervision.

(5) Better maintenance stockrooms are organized with the aim to make maintenance more efficient and cut inventory losses

(6) Maintenance personnel, both rank-and-file and supervisory, get training in all phases of maintenance, and learn something about production.

If a mine or plant is having too many breakdowns, that is a sure sign that preventive maintenance is needed.

Maintenance costs are not hard to justify. Check over records for the past year or more for all machine breakdowns. List the total cost of repair—labor, materials, overtime and other extra charges. List what each breakdown cost in idle time to production, then estimate what the repairs would have cost had they been made before the breakdown. You must consider the savings resulting from work planning, getting materials and efficient workmanship that were possible by doing the job before the breakdown. Do not overlook the intangible values of less downtime, increased output and lower depreciation of plant assets.

The difference in the above costs is what might be spent on preventive maintenance without all the encountered difficulties of production breakdown. It must be remembered that it probably costs twice as much today to replace a run-down mine or equipment or plant buildings as it did ten years ago.

## Preventive Maintenance Pays

An effective maintenance program is not too difficult to set up. Begin by listing all equipment, especially that causing the most delay due to breakdowns. Analyze this list for all items needing periodic inspection, cleaning, lubrication and adjustment. Establish systematized records for scheduling these functions at the proper frequencies, and for checking to see that the work is being done.

Lubrication, as a rule, is handled by a separate schedule. However, this does not mean that lubrication is not a preventive maintenance item. It probably should be number one on the list.

Good preventive maintenance does not stop with the maintenance engineer. Someone must see to it that a poor machine operator does not abuse the machine in operation. The management should also be conscious of the long range value of periodic shutdowns for machine inspection or overhaul—and support the program at every turn.

There are several companies that have set up such preventive maintenance programs. Let's take the loading machine, for example. A rebuilding program has been set up for loading machines with an average of 350,000 tons of coal loaded between rebuilds. It is intended to hold the mines to this schedule, and each mine is required to send in a monthly tonnage report for each loading machine. An accumulative tonnage report is kept at the central shop so at a glance it is possible to tell which machine is ready for overhaul. The mine superintendent is then notified to take that machine out of service. He receives, in turn, a rebuilt loader.

If the mine would keep a careful record of the parts used during the 350,000 tons service of a loader, then a history of the weaknesses of the various parts could be compiled. This would give management a valid argument on which to have a request for a change in design. This would also show the maintenance engineer which parts to check closely on the next rebuild so that some change in design might eliminate the bottlenecks.

This is just one phase of the preventive maintenance of the loader. The maintenance foreman must see that mine inspections are made at regular intervals so as to keep the machine in top-notch condition.

## Rebuilding Equipment

If a central shop exists rebuilding should not be done at the mine. If rebuilding is done at the mine, and there should be other breakdowns, the mine organization would be tempted to take short cuts in the rebuilding in order to get the machine back in operation. However, at a central shop the proper machine tools are available and an experienced rebuilding crew can do a job that will give a better producing machine.

Rebuilding on cutting machines is also done at the central shop. This work is done on units rather than on the entire machine at one time. The cutting head, for example, takes much more severe service than the main frame or the tramming mechanism. As yet a definite tonnage limit has not been set for cutting machines between rebuilds. Some heads have been rebuilt due mainly to weaknesses of certain parts. Tonnage reports are kept on all cutting machines so that a rebuilding program can be established.

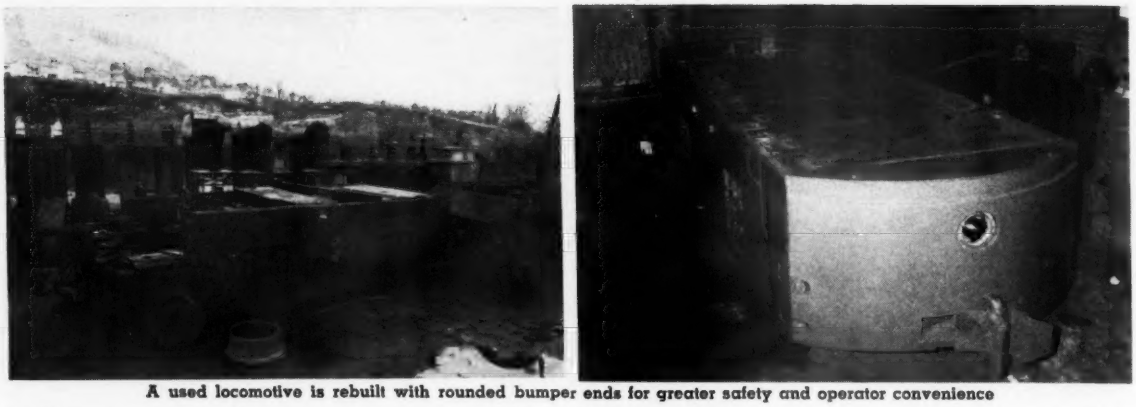
Similarly, a definite time has not been set on shuttle cars. They should be rebuilt every two years, and after the fourth year shuttle cars should be replaced as improvements have been coming rapidly, and there is still room for more. If and when a leveling off period of improvements occurs, a continued rebuilding program can be set on shuttle cars. A program of modernizing locomotives has been arranged. One reason is to get a better operating machine, and the other is to provide more safety to the operator. This is done by the installation of rounded ends to surround the motorman with 1¾ in. of armor plate. These plates were bent in a 400-ton hydraulic wheel press. It is a simple and cheap operation.

Interior view of an underground shop at Mine No. 93, Consolidation Coal Company (W. Va.)

Experiments are being carried on with a neoprene sponge lining in the cockpit to provide further protection to the motorman. This neoprene pad is 1 in. thick, and is coated with two coats of liquid neoprene to prevent nicking or cutting of the sponge. The sponge will not absorb water and will not support combustion.

## Lubrication Simplified

Lubrication is a universal problem. The human element is the fly in the ointment as a greaser will invariably neglect certain lubricating fittings. It is necessary to make lubrication as easy and simple as possible so the greaser will have a harder time miss-



A used locomotive is rebuilt with rounded bumper ends for greater safety and operator convenience

ing these neglected points. On most machines, where possible, these points have been brought to a central location by the use of high pressure grease lines leading to the necessary bearings and journals. Automatic centralized lubrication has been installed on many loading machines. This is installed at the time the machine is being rebuilt. New grease holes have to be drilled and the parts must be located so that they will be out of reach of falls and other mechanical damage. Eventually it is planned to have this type system on all machines.

Some companies have purchased or constructed grease cars or buggies equipped with powered grease guns. These are supplied with all necessary greases and oils used in mine service.

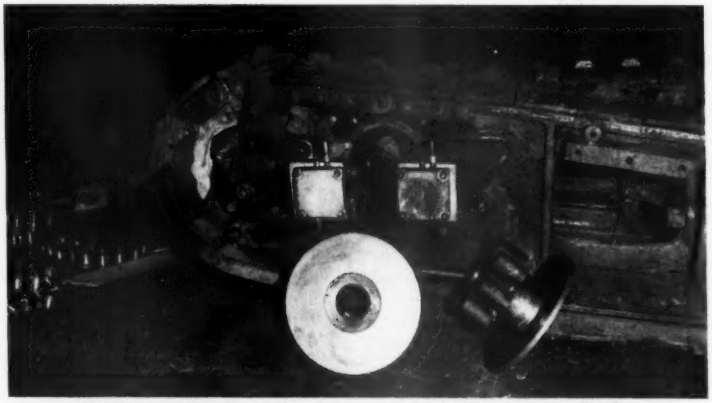
Maintenance men are furnished with grease charts that show a picture of each machine and all of its lubricating points, and the oil or grease to use. One of the leading grease companies sent in lubricating engineers to make a survey. They later submitted charts listing the mine equipment and recommendations for the proper grease or oil. One reason for this survey was to attempt to cut down on the number of products used, to limit inventory and simplify greasing and oiling.

## Substations and Transformers

Substation maintenance is most important as equipment for the conversion of alternating current to direct current is expensive. To pay $35,000 for an Ignitron Rectifier and be content with an incompetent service mechanic is far from wise. In case of substation trouble, don't be content to allow a mechanic who is not a substation expert tinker around in an effort to get the set started. He may push this or press that, what or why the result will be he does not know, and in many cases, he does not care.

A substation is a place that requires respect. High voltage is ever present, danger is continually around; for these reasons this is a job for a qualified substation man only. Someone who is familiar with the equipment and its control should be responsible for its maintenance. Where a central shop organization exists it should be responsible for substation maintenance.

As a preventive measure, a periodic inspection should be made of substations whether they be rotary converters, motor-generator sets, rectifiers, or just a transformer bank. Such things as commutation, brush pressure and wear, rings, and insulation dielectric should be watched and recorded at each inspection on rotating substations.



Installing airplane-type disc brakes on the "cat" frame of a loader

At rectifier stations the tubes should be checked at regular intervals. This is best done by an oscilliscope. This gives a picture of the work done by each tube. Tube failures can many times cause other costly failures, especially by the occurrence of open ignitors. Protective devices should be checked and recalibrated if necessary. They are on the sets for the protection of the unit, so they should be in proper working condition when needed. It is needless to say what the results are if they fail to function.

The cooling system on this type substation is highly important. It should be thoroughly inspected for leaks and signs of corrosion, and, in the case of units which have a positive trolley, should be checked for electrolysis. The water should be examined for the effectiveness of the inhibitor used.

Transformers merit mention as the cooling medium, whether liquid or air, should be checked. The liquid should be sampled and checked for water or acid condition and insulation qualities. In the case of air cooling, it is necessary that the winding be kept clean for proper cooling.

## Electrical Equipment

Let us analyze an electrical system in general. We do not dilute gasoline for automobile use, yet we sometimes try to run electrical equipment on diluted power. This we commonly know as excessive voltage drop, or just plain low voltage. This is most harmful. It causes overheating of the windings, which in turn breaks down the dielectric value of the insulation. Then, when good power is available, the insulation is not capable of handling the rated voltage, causing blowout of coils and armatures. Many times the substation capacity is present, but the production men are not willing to supply the pipe line, or cable, to deliver the power to the motor. Copper cable is expensive, but so are motor failures and repairs and you are only kidding yourself when you think you can skimp on cable use.

Included in considerations of electrical equipment are storage batteries. Without a thorough understanding of batteries, poor performance and high maintenance costs will result. When storage batteries were adopted one electrical engineer was sent to a battery school conducted by one of the battery manufacturers. There he spent a week learning the make-up and the correct maintenance procedures for batteries. On his return he held a similar school at each mine instructing all maintenance men, superintendents and other production bosses on the fundamentals of battery maintenance covering charging technique, inspection and repairs and proper reporting of this data. This school has certainly paid dividends as battery maintenance cost has been extremely low. This same engineer makes periodic checks at the mines to be sure that battery maintenance is being kept to standard.

## Inspection and Repair

For underground inspection and repair of equipment the mechanical and electrical work is combined so as to avoid duplication of personnel since the two types of maintenance are related. For outside shops the two jobs should be separate so we may have more specialization.

Manufacturers' handbooks give the maintenance men a lot of good information. By using this information along with the following accepted maintenance hints, a more satisfactory performance may be expected:

(1) Keep records—Inspect, report, and record results of inspections.

(2) Cleanliness—Keep interior of motors free from lubricants and dirt.

(3) Mechanical—Maintain belt or chain tension, shaft alignment, bearing supports and other mechanical features that may affect motor performance.

(4) Spare parts—Use only parts recommended by the manufacturer, or such changes that have been approved by the maintenance engineers.

(5) Permissibility—Plates must not be violated by damaged fits or missing bolts.

(6) Rebuilds—Motor rebuilding should be done only by skilled technicians so that the proper air gap, coil resistance and other motor characteristics may be maintained.

(7) Controls—Only approved wiring diagrams, controls and protective devices should be used.

(8) Operating conditions—Operate equipment within limits of the rated voltage of the machine.

(9) Lubricate — Use only recommended lubricant at the recommended periods.

## Good Facilities are Essential

If management expects maintenance to do as thorough a job as production, it is necessary that the maintenance department receive comparable facilities and equipment. The efficiency of maintenance stands to profit by the same refinements in machine tools, buildings, materials handling equipment, hand tools and instruments that are cutting costs for the production end.

Maintenance, many times, is just a necessary evil. No one wants it, but they haven't figured a way to eliminate it. It generally inherits the cast-off, outmoded buildings. It gets the second—or third hand machine tools. Men and machines are either cramped in tight quarters or scattered in sheds far apart. Tools and instruments are usually in pretty good shape, but there is not enough of them, and too few are up to date.

Fortunately management has spent a considerably large sum of money equipping our shops so that first class work can be done at a minimum of cost. Color dynamics is being considered in the painting of the shop interiors in an effort to get better efficiency from the men with less fatigue.

Many shops are dirty and ill-lighted. In these modern times men should not be expected to work under such conditions. Good housekeeping is an item that isn't too expensive, yet it is probably the most neglected. Try it sometime and see the results.

"Maintenance is the act of keeping up to standard or such changes that have been approved by the maintenance engineer or management." In order to do good maintenance, we must know and stick to these fundamentals:

(1) Safety
(2) Cooperation
(3) Knowledge of equipment
(4) Adequate records
(5) Adequate tools
(6) Adequate supplies
(7) Use of standard parts
(8) Inspection
(9) Cleanliness
(10) Orderliness
(11) First class workmanship
(12) Lubrication
(13) Planning.


*The Full Report*

*of the*

**1950 Coal Mining Convention**

***will be published in the***

**JUNE ISSUE**

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# Coal Looks Forward

## 1950 Coal Convention Lays Foundation for Future Progress

ONCE more the coal industry is preparing to forge ahead. The long period of curtailed working time and strikes has depleted coal stocks to the vanishing point. The future points toward high production levels. This period offers the industry an excellent opportunity to resume its interrupted progress towards greater efficiency—and plans that have been postponed will be taken up again.

A top priority factor is to regain public confidence in coal as a fuel. Efficient production, top quality and stability within the industry are essential ingredients in attaining this objective. The 1950 Coal Convention of the American Mining Congress to be held in Cincinnati, April 24-26, will shed revealing light on the means of solving production problems. In addition to operating problems, current topics of wide general interest will be analyzed to assist the industry in its forward march.

### Luncheons Feature National Figures

Two luncheons are scheduled on the Convention program. On Monday the Honorable A. Willis Robertson, U. S. Senator from Virginia, will talk on the "Preservation of Private Enterprise"—a topic in which every coal mining man is deeply interested. Senator Robertson is well known for his sound views on national affairs, and is a leader in the current efforts to place suitable restrictions under the anti-trust laws upon the monopolistic practices of labor unions. The Tuesday speaker will be Louis B. Seltzer, editor of the *Cleveland Press*, who will address the luncheon group on "The Biggest Threat to American Business."

Hon. A. Willis Robertson

Louis B. Seltzer

*Luncheon Speakers*

Under the direction of E. R. Price, national chairman of this year's Convention, an exceptionally comprehensive program has been arranged to bring to Cincinnati the foremost thinking of coal mining experts. The eleven sessions of the three-day meeting will cover the entire range of coal's administrative, economic and operating problems. Detailed papers and panel discussions will penetrate each topic to bring forth full measures of information. The program for the 1950 Convention marks a great forward step in the quality and diversity of subjects covered. Operating problems will receive prominence, with stress placed on new equipment and techniques as well as improvements in conventional methods.

Authors of papers include operators from bituminous and anthracite fields who will discuss problems of both deep and strip mining.

# PROGRAM Committee

★

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Clarkson Mfg. Co.

**HARRISON EITELJORG**
Morgan Mines, Inc.

**EVAN EVANS**
Lehigh Navigation Coal Co.

**M. H. FORESTER**
Pittsburgh Consolidation Coal Co.

**JOHN FOSTER**
Chicago, Wilmington & Franklin Coal Co.

**J. H. FULFORD**
Jeffrey Mfg. Co.

**J. A. GILRUTH**
Gould Storage Battery Corp.

**WILLIAM E. GOODMAN**
Goodman Mfg. Co.

**JOHN GRAHAM**
American Steel & Wire Co.

**CARL T. HAYDEN**
Sahara Coal Co.

**G. R. HIGINBOTHAM**
Consolidation Coal Co. (W. Va.)

**C. E. HOUGH**
Imperial Smokeless Coal Co.

**JAMES HYSLOP**
Hanna Coal Co.

**G. S. JENKINS**
Consolidated Coal Co.

**C. E. JONES**
Caterpillar Tractor Co.

**MERLE C. KELCE**
Sinclair Coal Co.

**A. S. KNOIZEN**
Joy Mfg. Co.

**K. L. KONNERTH**
H. C. Frick Coke Co.

**ROBERT W. LAHR**
Enterprise Wheel & Car Co.

**H. B. LEE**
Maumee Collieries Co.

**H. C. LIVINGSTON**
Union Pacific Coal Co.

**GORDON MacVEAN**
National Mine Service Co., Inc.

**A. R. MATTHEWS**
Clinchfield Coal Corp.

**H. E. MAUCK**
Olga Coal Co.

**E. F. MAURER**
Rail & River Coal Co.

**J. F. MAZZA**
Rochester & Pittsburgh Coal Co.

**L. O. MILLARD**
Link-Belt Co.

**THOMAS MURPHY**
Northwestern Improvement Co.

**M. W. PENNYBACKER**
I-T-E Circuit Breaker Co.

**C. J. PERRY, JR.**
E. I. du Pont de Nemours and Co.

**O. B. PRYOR**
Kelley's Creek Colliery Co.

**DAVIS READ**
West Kentucky Coal Co.

**G. M. RIGG**
Weirton Coal Co.

**GEORGE A. ROOS**
Philadelphia & Reading Coal & Iron Co.

**C. B. STAINBACK**
Westinghouse Electric Corp.

**E. F. STEVENS**
Pyramid Coal Corp.

**G. J. STOLLINGS**
Powellton Coal Co.

**C. W. WATERMAN, JR.**
McNally-Pittsburg Mfg. Corp.

**W. S. WEBSTER**
Walter Bledsoe & Co.

**PAUL WEIR**
Paul Weir Co.

In addition to operating men, there will be representatives of State and Federal Governments, together with representation from outside of the industry—men from universities who will talk on educational methods, and scientists from research laboratories who will discuss mine roof action and the seismic effect of overburden blasting. Leaders from other industries will describe successful methods of setting up and administering pension plans.

A carefully selected group of motion picture films will be shown preceding the various sessions. These have been chosen for the interest they will hold for coal mining men and cover a wide variety of topics.

Registration has again been streamlined by the method first used at the 1949 Coal Show. Forms have been received from the many industry groups listing those who will attend. Each man listed will be furnished with a hand-lettered badge and a card to be turned in at Cincinnati for registration. Through this procedure, designed to reduce the need for standing in line and to speed up the registration process, the full time at Cincinnati may be devoted to Convention proceedings.

**MAURICE D. COOPER**
Chairman, Floor Committee

A representative group of operators and manufacturers, under Chairman C. M. Donahue, will serve on the Welcoming Committee. They will greet Convention visitors and see that registrations are made without a hitch. Headed by Maurice D. Cooper, Chairman, a competent member of the Floor Committee will be on hand to assist each Session Chairman in conducting the meeting.

## Session Chairmen

**R. L. Adams**
*Old Ben Coal Corp.*

**J. Robert Bazley**
*J. Robert Bazley, Inc.*

*(Photos not available)*

**Max Forester**
*Pittsburgh Consolidation Coal Co.*

**R. H. Hughes**
*Clinchfield Coal Corp.*

**Dan Harrington**
*Arlington, Va.*

**Claude P. Heiner**
*Utah Fuel Co.*

**James Hyslop**
*Hanna Coal Co.*

**L. Russell Kelce**
*Sinclair Coal Co.*

**Hugh B. Lee**
*Maumee Collieries Co.*

**Frank G. Smith**
*Sunday Creek Coal Co.*

### Program Points to Progress

The program is an exceptional one as a brief study will promptly reveal. On Monday morn-

ing, April 24, only one session will be held, devoted to two topics of general interest—public relations and educational training. Sessions on roof bolting and strip mining will run concurrently on Monday afternoon. Every phase of roof bolting, ranging from the theory involved through special methods and examples of successful practice, will be discussed by competent authorities. Details of power requirements and distribution, vibration from overburden blasting and communications in strip mining will be anaylzed.

Coal drying and dewatering and mine safety sessions will take place concurrently on Tuesday morning. Methods in use in both the anthracite and bituminous fields, centrifugal and heat drying and desliming methods will be covered thoroughly. Safety programs in the various states and a description of what the U. S. Bureau of Mines is doing towards furthering safety education and safety training will be considered in a panel discussion on methods to reduce mine accidents. Sessions on Tuesday afternoon will cover deep and strip mining. Modern methods, power distribution and belt haulage papers are on one session and track haulage, time studies and maintenance will be discussed on the other underground session. Strip mining men will have an opportunity to hear a thorough treatment of the wheel excavator for overburden removal and other specialized methods.

Sessions on pension plans and coal preparation will take place on Wednesday morning. A group of men who have made special studies of the topic of employe pensions appear on the program. They will cover the human, actuarial and administrative phases of the subject. The session on coal preparation will be highlighted by overall pictures of the latest developments here and abroad and new practices in the problems of preventing and extinguishing persistent refuse pile fires.

**S. A. CASSIDY, President**
**Consolidation Coal Co. (Ky.)**
**and**
**Chairman of the Coal Division,**
**American Mining Congress**

**M. L. McCORMACK, Manager,**
**Rock Drill Dept., Ingersoll-Rand Co.**
**and**
**Chairman, Manufacturers Division,**
**American Mining Congress.**

**Mr. McCormack will preside at the Tuesday luncheon**

## Monday, April 24

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### 9:45 A. M.—OPENING SESSION

**Opening of Convention**

JULIAN D. CONOVER, *Secretary*, American Mining Congress.

Chairman: E. R. PRICE, *Manager Coal Properties*, Inland Steel Co.; *National Chairman*, Program Committee.

**Improved Public Relations**

A. C. SPURR, *President*, Monongahela Power Co.

**Educational Programs to Develop Supervisors**

H. C. LIVINGSTON, *Vice-Pres.*, Union Pacific Coal Co.

H. L. WALKER, *Head*, Department of Mining and Metallurgical Engineering, University of Illinois.

G. R. SPINDLER, *Director*, School of Mines, West Virginia University.

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### 12:15 P. M.—LUNCHEON

Presiding: HOWARD I. YOUNG, *President*, American Zinc, Lead & Smelting Co.; *President*, American Mining Congress.

**Address: "The Preservation of Private Enterprise"**

By Hon. A. WILLIS ROBERTSON, *U. S. Senator from Virginia.*

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### 2:30 P. M.—ROOF BOLTING

Chairman: FRANK G. SMITH, *Vice-President in Charge Operations*, Sunday Creek Coal Co.

**Theory of Roof Bolting**

PROF. P. B. BUCKY, *Executive Officer*, School of Mines, Columbia University.

**Roof Bolting in Thin Seams**

HENRY S. JAMISON, *Assistant Engineer*, Delmont-Peerless Coal Co.

**Use of Wood Pins**

STERLING S. LANIER, JR., *President*, Norton Coal Corp.

**Applications in Pitching Measures**

D. E. INGERSOLL, *Division Superintendent*, Philadelphia & Reading Coal & Iron Co.

**Successful Practices in Alabama**

E. H. STEVENS, *Project Engineer*, Tennessee Coal, Iron & Railroad Co.

**Accidents in Roof Bolting**

EDWARD M. THOMAS, *Chief*, Roof Control Section, U. S. Bureau of Mines.

**Mechanical Equipment to Suit Various Conditions**

DR. T. H. TROLLER, *Vice-Pres.*, Joy Mfg. Co.

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### 2:30 P. M.—STRIP MINING

Chairman: J. ROBERT BAZLEY, *President*, J. Robert Bazley, Inc.

**Power Requirements for Strip Mines**

MAURICE L. QUINN, *Chief Electrical Engineer*, Sinclair Coal Co.

**Grounding 440-V Circuits**

L. E. BRISCOE, *Electrical Engr.*, Ayrshire Collieries Corp.

**Vibrations from Heavy Overburden Blasting**

DR. L. DON LEET, *Seismologist in Charge*, Harvard University Seismograph Station.

**Radio Communication in Strip Mines**

L. W. BARCO, *Asst. Supt.*, United Electrical Coal Cos.

### 2:30 P. M.—ANNUAL MEETING MANUFACTURERS DIVISION

## Tuesday, April 25

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### 9:30 A. M.—DRYING AND DEWATERING

Chairman: JAMES HYSLOP, *President*, Hanna Coal Co.

**Centrifugal Dryers and Filters**

L. O. LOUGEE, *Mining Engineer*, George S. Baton & Co.

# MEET THE SPEAKERS

**On Pages 42-45**

**Drying and Dewatering in Central Pennsylvania**
F. P. CALHOUN, *Assistant Production Manager*, Rochester & Pittsburgh Coal Co.

**Mechanical Drying in West Kentucky**
F. R. BUCKLEY, *Preparation Engineer*, and
GEORGE LAND, *Director of Research*, West Kentucky Coal Co.

**Dewatering and Heat Drying**
F. C. MENK, *Director of Engineering*, Island Creek Coal Co.

**Anthracite Methods**
WILLIAM T. TURRALL, *Preparation Engineer*, Lehigh Navigation Coal Co.

**Recovering and Desliming Fine Coal in Illinois**
R. L. SUTHERLAND, *Combustion Engineer*, Truax-Traer Coal Co.

**Sludge Reclamation at Peabody Coal Co.**
JOHN L. ERISMAN, *Manager, Dryer Division*, Link-Belt Co.

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### 9:30 A. M.—MINE SAFETY

Chairman: DAN H. HARRINGTON, *former Chief*, Health and Safety Branch, U. S. Bureau of Mines.

**Anthracite Safety Progress**
R. J. HOWELL, *Safety Engineer*, Glen Alden Coal Co.

**Safety Program in Kentucky**
A. D. SISK, *Chief*, Kentucky Department of Mines and Minerals.

**Safety Practices in Indiana**
RALPH WHITMAN, *Superintendent*, Ingle Coal Co.

**The Human Equation**
C. R. STAHL, *Assistant to Vice-President*, Eastern Gas & Fuel Associates.

**What the U. S. Bureau of Mines Is Doing**
J. J. FORBES, *Chief*, Health and Safety Branch, U. S. Bureau of Mines.

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### 12:15 P. M.—LUNCHEON

Presiding: M. L. MCCORMACK, *Mgr., Rock Drill Dept.*, Ingersoll-Rand Co.; *Chairman*, AMC Manufacturers Division.

**Address: "The Biggest Threat to American Business"**
LOUIS B. SELTZER, *Editor, The Cleveland Press.*

### 2:30 P. M.—DEEP MINING

**Power and Haulage**

Chairman: CLAUDE P. HEINER, *Pres.*, Utah Fuel Co.

**The Use of A-C Power Underground**
J. O. CREE, *Elec. Engr.*, West Virginia Engineering Co.
DAVID STOETZEL, *Mining Division*, General Electric Co.

**Power Controls for Belt Conveyors**
GEORGE T. ATKINS, *Electrical Engineer*, Barnes & Tucker Co.
W. F. ROBERTS, *Electrical Engineer*, Jeffrey Mfg. Co.

**Modern Mine Haulage With Belts**
C. W. THOMPSON, *Assistant Manager*, Weirton Coal Co.

**Modern Underground Track Haulage**
G. F. LEATHERMAN, *Superintendent*, Power and Mechanical Department, Inland Steel Co.

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### 2:30 P. M.—DEEP MINING

**Time Studies and Maintenance**

Chairman: ROY L. ADAMS, *Vice-President*, Old Ben Coal Corp.

**Results of Time Studies to Improve Operating Efficiency**

Face Preparatory:
JOHN K. BERRY, *Production Engineer*, Consolidation Coal Co. (Ky.).

Mechanical Loading:
PAUL R. PAULICK, *Cons. Mining Engr.*, Library, Pa.

Service Haulage:
PROF. A. W. ASMAN, *Chief*, Division of Mining, Pennsylvania State College.

**Maintenance of Mining Equipment**
GEORGE L. JUDY, *Assistant Maintenance Superintendent*, Consolidation Coal Co. (Ky.).

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### 2:30 P. M.—STRIP MINING

Chairman: L. RUSSELL KELCE, *Pres.*, Sinclair Coal Co.

**Use of Voltages Higher Than 4000 for Large Equipment**
J. E. BORLAND, *Mining Div.*, Westinghouse Electric Corp.

**Wheel Excavator for Overburden Removal**
J. J. HUEY, *Chief Elec. Engr.*, United Electric Coal Cos.

**Measurable Advantages of Outside Curves**
LAFE STEWART, *Engineer*, Maumee Collieries Corp.
R. M. DICKEY, *Sales Engineer*, Bucyrus-Erie Co.

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### 8:00 P. M.—COAL MINERS PARTY

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## Wednesday, April 26

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### 9:30 A. M.—PENSION PLANS

Chairman: HUGH B. LEE, *Vice-President*, Maumee Collieries Co.

(*Continued on page 46*)

# Manufacturers Division . .

**THROUGH the Manufacturers Division, these leading manufacturers and suppliers of mining equipment, machinery and services cooperate fully with the other divisions of the American Mining Congress in promoting the welfare and sound development of the mining industry of the United States.**

*Allis-Chalmers Mfg. Co.
Alloy Steel & Metals Co.
*American Brake Shoe & Foundry Co.
American Brattice Cloth Corp.
*American Car & Foundry Co.
American Chain & Cable Co.
*American Cyanamid Co.
American Mine Door Co.
Anaconda Wire & Cable Co.
*Atlas Powder Co.

Baker-Raulang Co.
Barber-Greene Co.
Bixby-Zimmer Engineering Co.
Bowdil Co.
Broderick & Bascom Rope Co.
*Brown-Fayro Co.
Bucyrus-Erie Co.

Cambridge Machine & Supply Co.
Card Iron Works Co., C. S.
Cardox Corp.
Caterpillar Tractor Co.
*Central Frog & Switch Co.
Central Mine Equipment Co.
Centrifugal & Mechanical Industries Inc.
Chicago Pneumatic Tool Co.
Cincinnati Mine Machinery Co.
Cities Service Oil Cos.
Clarkson Mfg. Co.
Colorado Iron Works Co.
Continental Gin Co.

D-A Lubricant Co., Inc.
Deister Concentrator Co.
Differential Steel Car Co.
Dow Chemical Co., Great Western Div.
Duff-Norton Mfg. Co.
*Du Pont de Nemours & Co., Inc., E. I.

*Edison, Inc., Thomas A.
Eimco Corp.
Electric Storage Battery Co.
*Elreco Corp.
Ensign Electric & Mfg. Co.
*Enterprise Wheel & Car Corp.
Euclid Road Machinery Co.

Fairmont Machinery Co.
Firestone Tire & Rubber Co.
Flood City Brass & Electric Co.

Gardner-Denver Co.
*General Electric Co.
*Goodman Mfg. Co.
Goodrich Co., B. F.
Goodyear Tire & Rubber Co.
Gorman-Rupp Co.
Gould Storage Battery Corp.
Gruendler Crusher & Pulverizer Co.
Guyan Machinery Co.

Harnischfeger Corp.
Helmick Foundry-Machine Co.
*Hendrick Mfg. Co.
Hendrix Mfg. Co., Inc.
*Hercules Powder Co.
Hewitt-Robins Incorporated
Heyl & Patterson, Inc.
*Hockensmith Corp.
*Holmes & Bros., Inc., Robert
*Hulburt Oil & Grease Co.

Independent Pneumatic Tool Co.
Ingersoll-Rand Co.
International Nickel Co., Inc.

* Charter Members.

Interstate Equipment Div., Yara Engrg. Corp.
Irwin Foundry & Mine Car Co.
*I-T-E Circuit Breaker Co.

*Jeffrey Mfg. Co.
Johnson-March Corp.
*Joy Mfg. Co.

Kanawha Mfg. Co.
Kansas City Structural Steel Co.
Kensington Steel Co.
Koehler Mfg. Co.

LaBour Co., Inc.
Lee-Norse Co.
LeRoi Co., Cleveland Div.
*Leschen & Sons Rope Co., A.
*Link-Belt Co.
Longyear Co., E. J.
Ludlow-Saylor Wire Co.

*McGraw-Hill Publishing Co.
McLanahan & Stone Corp.
*McNally-Pittsburg Mfg. Corp.
Mack-International Motor Truck Corp.
Macwhyte Company
Marion Power Shovel Co.
Mechanization, Inc.
*Mine Safety Appliances Co.
Mine & Smelter Supply Co.
Mining Machine Parts, Inc.
Mosebach Electric & Supply Co.
Mott Core Drilling Co.
*Myers-Whaley Co., Inc.

National Electric Coil Co.
National Malleable & Steel Castings Co.
National Mine Service Co.
Nordberg Mfg. Co.

*Ohio Brass Co.
Ohio Oil Co.
Okonite Co., Hazard Insulated Wire Wks., Div. of
Oliver Iron & Steel Corp.
Osmose Wood Preserving Co.
Owens-Corning Fiberglas Corp.

Pacific Foundry Co., Ltd.
Page Engineering Co.
Paris Mfg. Co.
Penn Machine Co.
Pennsylvania Electric Coil Corp.
*Phillips Mine & Mill Supply Co.
Pittsburgh Gear Co.
Post-Glover Electric Co.
Precision Chain Co.
Productive Equipment Corp.
Prox Co., Inc., Frank

Quaker Rubber Corp.

Raybestos-Manhattan, Inc.
Reliance Electric & Engrg. Co.
*Roberts & Schaefer Co.
*Roebling's Sons Co., John A.
Rome Cable Co.

Safety First Supply Co.
Salem Tool Co.
Sauerman Bros., Inc.
Sheffield Steel Corp.
*Simplex Wire & Cable Co.
Simplicity Engineering Co.
*S K F Industries, Inc.
Sprague & Henwood, Inc.
Stearns-Roger Mfg. Co.
Stephens-Adamson Mfg. Co.
Sterling Steel Casting Co.
Sun Oil Co.

Tamping Bag Co.
Templeton, Kenly & Co.
Texas Co.
*Timken Roller Bearing Co.
Tool Steel Gear & Pinion Co.
Traylor Engineering & Mfg. Co.
*Tyler Co., W. S.

Ultra-Violet Products, Inc.
Union Iron Works
Union Wire Rope Corp.
*United Engineers & Constructors, Inc.
U. S. Rubber Co., Wire & Cable Div.
U. S. Rubber Co., Mech. Goods Div.
*U. S. Steel Corp. Subsidiaries

Vulcan Iron Works Co.

Wedge Wire Corp.
*Weir Kilby Corp.
Western Machinery Co.
*Westinghouse Electric Corp.
West Steel Casting Co.
West Virginia Steel & Mfg. Co.
Worthington Pump & Machinery Corp.

# MEET THE Speakers

## Public Relations and Education

Monday Morning

A. C. Spurr
*Monongahela Power Co.*

H. C. Livingston
*Union Pacific Coal Co.*

H. L. Walker
*University of Illinois*

G. R. Spindler
*West Virginia University*

## Roof Bolting

Monday Afternoon

Prof. P. B. Bucky
*Columbia University*

Henry S. Jamison
*Delmont-Peerless Coal Co.*

D. E. Ingersoll
*Philadelphia & Reading Coal & Iron Co.*

*(Photo not available)*

Sterling S. Lanier, Jr.
*Norton Coal Corp.*

E. H. Stevens
*Tennessee Coal, Iron & Railroad Co.*

Edward M. Thomas
*U. S. Bureau of Mines*

Dr. T. H. Troller
*Joy Manufacturing Co.*

## Strip Mining

Monday and Tuesday Afternoons

Maurice L. Quinn
*Sinclair Coal Co.*

L. E. Briscoe
*Ayrshire Collieries Corp.*

Dr. L. Don Leet
*Harvard University Seismograph Station*

L. W. Barco
*United Electric Coal Cos*

J. E. Borland
*Westinghouse Electric Corp.*

J. J. Huey
*United Electric Coal Cos.*

Lafe Stewart
*Maumee Collieries Corp.*

R. M. Dickey
*Bucyrus-Erie Co.*

## Drying and Dewatering

Tuesday Morning

L. O. Lougee
*George S. Baton & Co.*

F. P. Calhoun
*Rochester & Pittsburgh Coal Co.*

George Land
*West Kentucky Coal Co.*

John L. Erisman
*Link-Belt Co.*

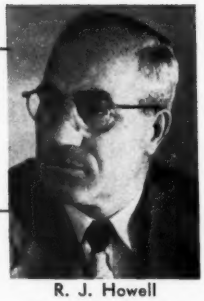
F. C. Menk
*Island Creek Coal Co.*

William T. Turrell
*Lehigh Navigation Coal Co.*

R. L. Sutherland
*Truax-Traer Coal Co.*

## Mine Safety

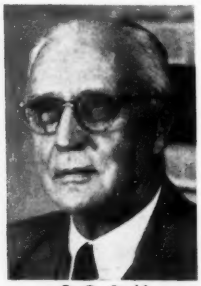
### Tuesday Morning



R. J. Howell
*Glen Alden Coal Co.*

A. D. Sisk
*Kentucky Dept. of Mines and Minerals*

Ralph Whitman
*Ingle Coal Co.*



C. R. Stahl
*Eastern Gas & Fuel Associates*

J. J. Forbes
*U. S. Bureau of Mines*

J. O. Cree
*West Virginia Engineering Co.*

David Stoetzel
*General Electric Co.*

## Deep Mining

### Tuesday Afternoon

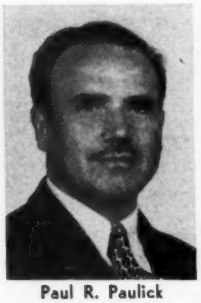
George T. Atkins
*Barnes & Tucker Co.*

W. F. Roberts
*Jeffrey Mfg. Co.*

C. W. Thompson
*Weirton Coal Co.*

G. F. Leatherman
*Inland Steel Co.*

John K. Berry
*Consolidation Coal Co. (Ky.)*



Paul R. Paulick
*Library, Pa.*

Prof. A. W. Asman
*Pennsylvania State College*

George L. Judy
*Consolidation Coal Co. (Ky.)*

## Pensions Plans

Wednesday Morning

Roscoe C. Edlund
*Fred Rudge, Inc.*

J. W. Myers
*Standard Oil Co. (N. J.)*

C. N. Crichton
*Johnstown Coal & Coke Co.*

## Coal Preparation

Wednesday Morning

John Griffen
*McNally-Pittsburg Mfg. Corp.*

A. C. Richardson
*Battelle Memorial Institute*

Henry F. Hebley
*Pittsburgh Consolidation Coal Co.*

E. T. Powell
*The M. A. Hanna Co.*

## Continuous Mining

Wednesday Afternoon

Gerald von Stroh
*Bituminous Coal Research, Inc.*

William E. Hess
*Jones & Laughlin Steel Corp.*

W. J. Phillips
*Sunnyhill Coal Co.*

C. E. Hugus, Jr.
*Reliance Electric & Engineering Co.*

M. F. Cunningham
*Goodman Manufacturing Co.*

R. M. Hunter
*Rochester & Pittsburgh Coal Co.*

HOWARD I. YOUNG
President
American Zinc, Lead & Smelting Co.
President, American Mining Congress

Wednesday afternoon will be given over entirely to continuous mining and the various problems involved in practice, using the principal types of machines. The future of continuous mining will be appraised in the light of accomplishments made to date.

### Exceptional Entertainment

Unusual and absorbing diversion is a "must" at every convention and the 1950 Convention at Cincinnati offers some splendid occasions that will be remembered as meeting "high spots" for a long time to come. Baseball fans will have the opportunity to see the Cincinnati Reds play the St. Louis Cardinals on Monday evening. A special "Mining Congress Section" has been arranged, and a big turnout of coal operators and manufacturers have reserved seats in this section to see and support their choice of these two top-flight baseball teams.

The Coal Miners Party, originally scheduled for Monday night, has been shifted to Tuesday evening. This informal gathering will feature a fine buffet supper, good music and a heap of fun. Versatile entertainment by talented professionals will add to the festivities.

The Annual Banquet on Wednseday evening —outstanding social function of the coal mining year—will be marked by fine food, a brief introduction of honored guests and no

## PROGRAM (*Continued from page 39*)

**Informing Employes Concerning the Problems of Pensions**
ROSCOE C. EDLUND, *Plans Board Chairman*, Fred Rudge, Inc.

**A Future Pattern for Voluntary Pension Plans**
J. W. MYERS, *Manager*, Insurance and Social Security Dept., Standard Oil Co. (N. J.).

**The Pension Plan of Johnstown Coal and Coke Co.**
C. N. CRICHTON, *Secretary-Treasurer*, Johnstown Coal and Coke Co.

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### 9:30 A. M.—COAL PREPARATION

Chairman: R. H. HUGHES, *Chief Engineer*, Clinchfield Coal Corp.

**European Trends in Coal Cleaning**
JOHN GRIFFEN, *Consulting Engineer*, McNally Pittsburg Mfg. Corp.

**Latest Developments and Trends in Coal Preparation**
A. C. RICHARDSON, *Concentration Engineer*, Battelle Memorial Institute.

**Preventing and Extinguishing Fires in Surface Refuse Banks**
HENRY F. HEBLEY, *Director of Research*, Pittsburgh Consolidation Coal Co.
E. T. POWELL, *Chief Engineer*, Susquehanna Collieries Division, The M. A. Hanna Co.

### 2:30 P. M.—CONTINUOUS MINING

Chairman: MAX FORESTER, *Vice-President*, Pittsburgh Consolidation Coal Co.

**Present Status and Future Possibilities of Continuous Mining**
GERALD VON STROH, *Director*, Mining Development Committee, Bituminous Coal Research, Inc.

**Operating With a Continuous Miner**
WILLIAM E. HESS, *General Superintendent*, Vesta-Shannopin Division, Jones & Laughlin Steel Corp.

**Operating With the Colmol**
W. J. PHILLIPS, *Asst. to President*, Sunnyhill Coal Co.

**Service Haulage for Continuous Mining**
M. F. CUNNINGHAM, *Sales Manager*, Goodman Mfg. Co.

**Power for Continuous Mining**
R. M. HUNTER, *Electrical Engineer*, Rochester & Pittsburgh Coal Co.
C. E. HUGUS, JR., *Supervisor of Mining Applications*, Reliance Electric & Engineering Co.

**Ventilation Problems in the Working Panels**
RUSSEL HERBY, *In chg. Safety Department*, Pennsylvania Coal and Coke Corp.

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### 7:00 P. M.—ANNUAL BANQUET

## *Staff of American Mining Congress*

Julian D. Conover
*Secretary*

A. W. Dickinson
*Legislation*

P. D. McMurrer
*Assistant to Secretary*

Harry L. Moffett
*Publicity*

William I. Powell
*Taxation*

G. B. Southward
*Mechanization Engineer*

Sheldon P. Wimpfen
*Editor*
*Mining Congress Journal*

Ralph Duysters

Frank Moran

*Field Representatives—Mining Congress Journal*

speeches. A series of popular entertainers will put on a number of brilliant variety acts to round out a perfect banquet and wind up the three-day Convention.

Ladies are urged to attend the entertainment features of the meeting and in addition, some special daytime events are being scheduled for them. Cincinnati has many attractions and the ladies will derive much pleasure from these convention activities.

There is the story! A well-rounded meeting bringing forth full information on the industry's many problems. Forward looking coal mining men have contributed much time and effort to present their views of the means of continuing progress and improving efficiency. This year's Coal Convention points the way to recapture lost markets and create new ones, and thus bring coal to its proper place as the basic prime mover of the American economy.

## —Monday—

**BASEBALL NITE**

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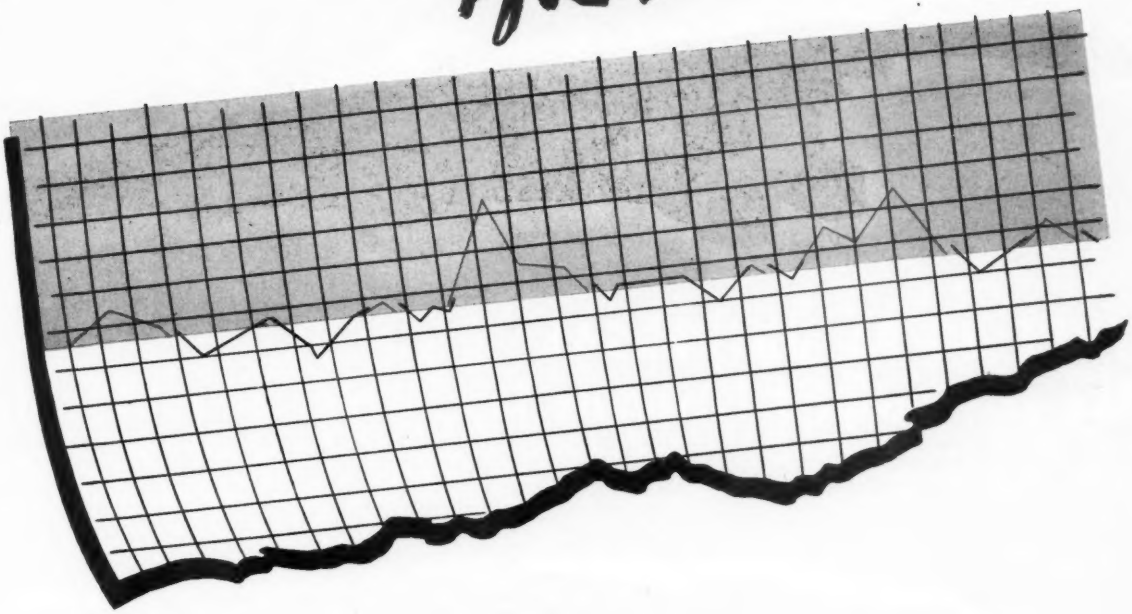

Chart the week-to-week demand and the week-to-week costs of your mine's motor maintenance-repair shop and you'll find that the red ink is concentrated at the periods of peak demand. Normally, the shop probably operates efficiently. But the peak demands cost overtime, and rushed, slighted work. To overcome that condition you'd have to over-equip and over-man your shop. And that means higher cost every day. Many mine operators, on the other hand, are operating such shops with very high efficiency. They are equipped and manned to handle the normal demand; they turn over the peaks — the red ink jobs — to us. Thus they avoid the vicious circle of excessive labor costs and excessive overhead. They get work, too, comparable to the best they can do themselves. We've done so much mine motor and generator work we know how; we're efficient; our costs are low. That means *your* costs are low, both in your shop and in ours. Our engineers will be glad to come to your office to suggest experienced ways and means of taking the top costs out of *your* motor and generator work. Just drop us a line.

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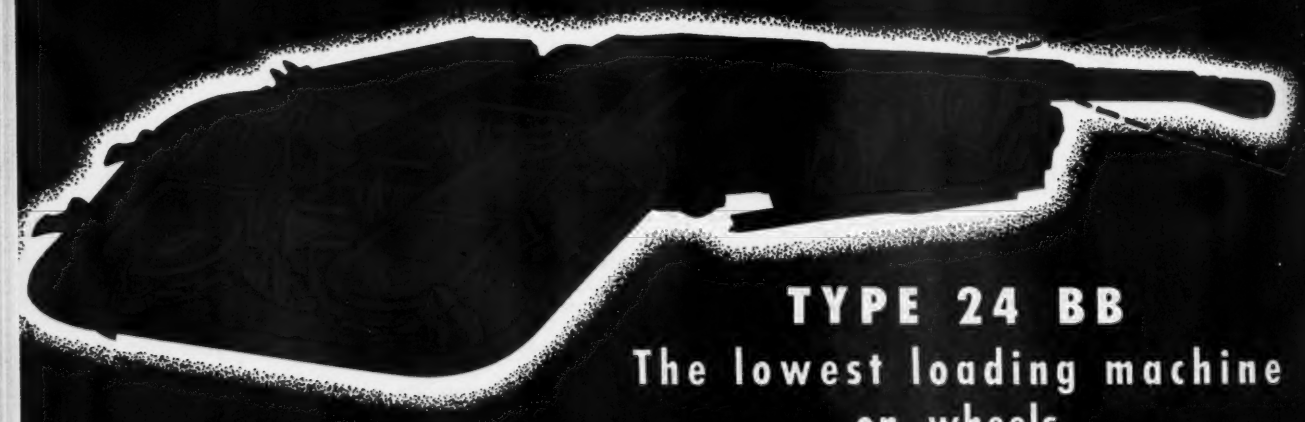

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**The lowest loading machine on wheels**

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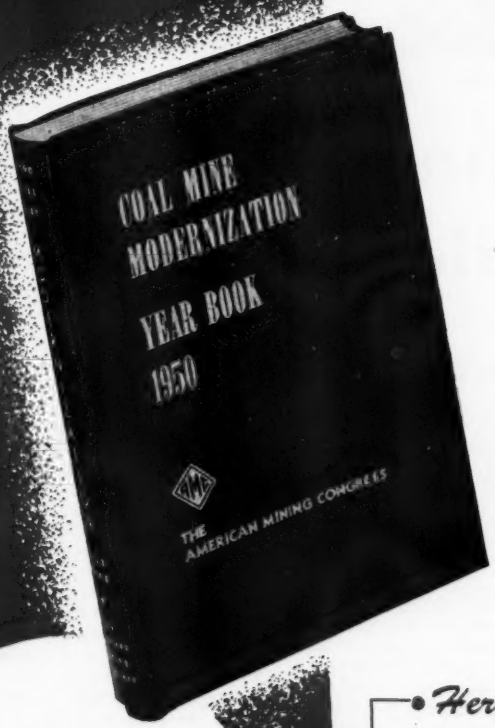


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Radio communications reduce time losses to integrate Chino operations

# How Mobile Communications Improve Production

## Two-Way Radio Units Facilitate Open-Pit Operations

By WARD E. BALLMER
Public Relations Engineer
Chino Mines Division
Kennecott Copper Corp.

IN keeping with the many major advances in equipment and methods and improved recovery systems, the mining industry has not been hesitant to use scientific developments in many auxiliary phases necessary to its efficient operation. An illustrative example of this is the installation of a modern communication system recently established in the historic open-pit copper mine at Santa Rita, N. M. This property, owned and operated by the Chino Mines Division of Kennecott Copper Corp., is believed to be one of the first large-scale operations to put into extensive use short-wave communication sets.

These mobile two-way sets are mounted in nine foremen's trucks at this writing, and plans call for future installation of several more. A large central dispatch station is operated at the traffic-directing point overlooking the pit. Key men in the mining operations are thus kept in constant touch with one another and with the dispatch station. This closer contact has resulted in a noteworthy saving of time and waste motion throughout the pit and on the adjacent waste dumps.

The need for improved communications became apparent during the rush war years when Chino, like other copper mining properties, was concentrating its entire effort toward the uninterrupted production of the vitally-needed red metal. During this period of full scale around-the-clock operation there was no time to be utilized in trying new innovations, nor could new equipment of any kind be readily acquired. Indeed, there was but little time available for major repairs and overhaulings sorely needed on the machinery and equipment then being used.

Immediately following the war, however, officials began planning installation of new equipment to replace that which was worn out and planning extensive changes and improvements in many phases of Chino's operations. Among these were plans to better the existing communication system throughout the pit and between the mine operations at Santa Rita and the concentrator, smelter and fire refinery workings located some ten miles distant at Hurley, N. M.

It was reasoned that improved telephone connections between Santa Rita and Hurley would serve to keep the two operations more closely united. As a commercial project was in progress at that time to bolster phone services between these communities by the installation of a dial-phone exchange midway between them, Chino's problem resolved itself to one of the mine operations alone.

### Telephones Considered

Increased telephone communication throughout the pit and over the waste dumps was quite impractical as there would needs be a mountainous volume of maintenance work required. As the benches expanded and moved back

into the hillside, prone installations would likewise have to be moved. Regular blasting, necessary along each bench, could easily cause considerable damage to the wires and interrupt communications at any time. For these reasons, the further use of telephones to improve existing communications was deemed inadvisable.

The next question to arise was, "What next?". Detailed study of trolley phones and mobile radio sets, similar to those used by many taxi companies and police departments, indicated the possibility of adapting either system to advantage at Santa Rita. The trolley phones, installed in the electric locomotives used in the haulage of ore and waste, could acquire their power from the overhead lines feeding the locomotives. The placing of a phone in each locomotive and one in the traffic-directing station, "Lookout," would keep the enginemen constantly in touch with the dispatcher.

Mobile radio sets could be used in the foremen's trucks that cover the pit over a system of roads Chino maintains from one bench to another and along each level. These roads tie into byways leading out over the dumps and to the precipitating plant, situated approximately a mile and a half below the main pit.

Study indicated that either the trolley phones or the mobile units would answer the need for better communications if they could be adapted to conditions existing at Santa Rita. There was some doubt as to their ability to keep constant communications in such a highly mineralized area, however, as the presence of "blind spots" has long been one of the phenomena of radio reception in such regions.

## Trolley-Phones Tested

Satisfied that the possibility of advantageously using one of the systems existed, Chino officials called for a period of experimentation. In July 1948, the trolley-phone system was given a thorough test. One set was installed at Lookout and another mounted in the cab of one of the electric locomotives that traversed the entire 40 miles of track in Chino's operation. A constant effort to keep contact between the locomotive and Lookout was made during this trip.

This experiment proved the trolley-phones to be impractical for Chino's needs. In many instances their power would be momentarily cut off when the pantograph would lose contact with the overhead lines. This resulted in poor reception and transmission of messages. In other localities where the rails were not bonded on the bench track no contact at all could be established with Lookout.

Interference from other locomotives and electrical installations along the line garbled much of the signal and no contact whatsoever could be maintained between Lookout and the locomotive when the latter was out on the dump. Much of the time, naturally, excellent communications were maintained, but the presence of too many interferences made the application of trolley phones out of the question.

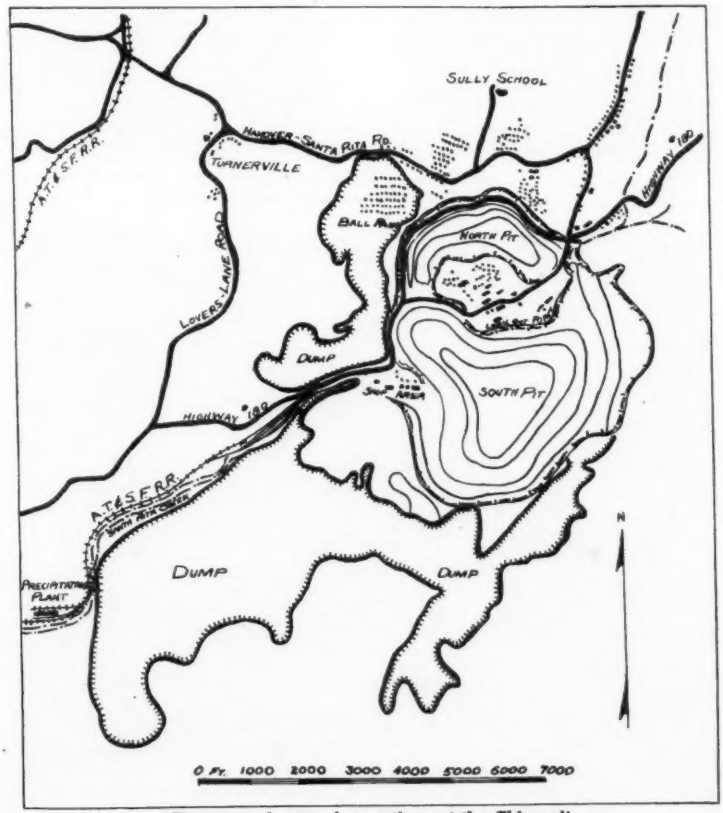
**Lack of adequate communications has always caused delays in mining operations. Widespread activities have been difficult to integrate. At the Chino open pit, the Kennecott Copper Corp. has conducted exhaustive tests that resulted in adoption of two-way mobile radio units to synchronize ore production operations and speed up repairs on operating equipment.**

## Radio Tests Conducted

Two-way radios were then tested. The first test, conducted late in July 1948, was with equipment operating on a frequency in the 152-162 megacycle band. A stationary set operating on 110-v, a-c current was established at Lookout and a mobile unit, consisting of transmitter and receiver operated by a storage battery, was mounted in the cab of a working locomotive. Numerous "blind spots" occurred throughout the pit and many on the dumps and the electrical engineers conducting the test decided to experiment with a lower frequency.

Frequency modulated (FM) equipment operating in the 30-40 megacycle band was then given a check. The mobile unit was installed in a locomotive and was given a strenuous 24-hour test. Reception was excellent throughout. During the test the equipment was used to good advantage in relaying orders to shovel crews and in helping with a derailment. The mobile unit was then transferred to a truck and a road test was made between Santa Rita and Hurley, but no signals were obtained beyond a point some five miles from Lookout.

Further experimentation with the lower frequency consisted of moving the dispatch unit to a higher elevation with remote control lines connect-




The general area of operations at the Chino pit

ing the equipment to the operator in Lookout. Again reception throughout the pit and over the dumps was clear, and a road test to Hurley demonstrated that radio communications could be successfully established at that distance. Thus, by setting the transmitter atop a nearby mountain and raising a 20-ft antenna, the coverage of the sets at the lower frequency had more than doubled in area.

Need for radio communications between Santa Rita and Hurley was not pressing, though, and the added installations necessary to make such contact satisfactory were not deemed practical. If at some future time such contact is desirable, the experience gained through these lengthly tests will prove very beneficial.

## Low Frequency Proves Best

Not yet completely satisfied with all phases of the tested equipment, Chino made arrangements with other manufacturers of portable radio equipment to test their sets. Experiments with various makes at different frequencies followed the pattern described above. This testing of equipment lasted well into the latter part of August 1948, before officials determined which would best suit their needs.

The equipment chosen operates on a frequency in the 152-162 megacycle band and consists of a 30-w station set with transmitter and receiver installed at Lookout. The mobile units, containing both transmitter and receiver, operate on 7½ w. Reception between Lookout and all mobile units within a two-mile radius is excellent and in the main, contact between two mobile units is the same. Communications between two mobile units is difficult, however, when one unit is in the lower area of the pit and the other on the waste dumps, but messages are relayed through Lookout in these cases.

Following the selection of equipment, application was filed with the Federal Communication Commission for permission to operate up to 35 units in the 152-162 megacycle band and in the Santa Rita area. During the six to eight-week period of waiting for a license, Chino continued to experiment with the sets and learned that the mobile units, operating on a 6-V-2 battery through a vibrator power supply, are not as yet adaptable for continuous use in the locomotives as no satisfactory method of battery-charging has been devised. When this factor has been worked out it is planned to install mobile units in the locomotives as well as in several more of the foremen's trucks.

The FM sets are remarkably free from normal interference and the electric locomotives and other electrical installations in the operations do not produce any appreciable static in them. Operators are constantly in touch with all conversations going on over the air and thus know at all times what is going on throughout the entire operations.

## Radio Reduces Down Time

The sets have proved invaluable in quickly getting supplies and repair parts to points where they are needed. As an exmaple: Recently a small connecting pin on the boom of one of the shovels in the lower section of the pit gave way, putting the shovel temporarily out of use. Previously, it would have been necessary to locate the new part, journey back into the pit and replace it. As this procedure frequently consumed a lengthy period, the shovel crew would have been transported to another shovel and the incoming train would have been rerouted.

In this instance, however, a member of the maintenance crew merely described the broken part to the foreman of the machine shop, indicating to him just which pin was needed. The bench foreman, hearing the conversation on his radio, broke into the circuit and said that as he was on his

From the traffic-directing station at Lookout, operator Lloyd Grinslade tells locomotive operators where to pick up cars

Switch engine engineer Leon Keys calls Lookout for orders

way into the pit he would deliver the part to the shovel. He obtained the proper pin at the machine shop, took it to the shovel and the minor repair was made before the regularly scheduled train had arrived.

The sets themselves are easily operated. The user, by keeping the power on, hears all messages going over the circuit and merely has to press a "talk" button on his own microphone to transmit his message. Compactly built, the mobile sets need only 137 sq in. of floor space for the transmitter and receiver which are housed in the same chassis. The controls and microphone are mounted on the dashboard of the trucks within comfortable reach of the driver. A quarter-wave antenna mounted on the roof of the cab serves for both transmitter and receiver and due to the high frequency of operation, these antennas are quite short in length. They are cut to the specified length at the factory.

The receiver on the mobile units contains 15 tubes and the transmitter 9. The combined weight of the two units is 32 lb. As both transmitter and receiver are crystal controlled, these is never an excess of .005 percent frequency variation throughout the various seasons of the year. These FM sets are actually clearer in the transmission of the voice than are most telephones.

In the period the sets have been in constant use at Chino, considerable improvement has been reflected in production figures. One of the most noticeable savings of time has been in the routing of trains and the placement of shovels in either waste or ore bodies. Santa Rita's operation is unique in that the ore and waste stations run so close together that sample must be taken and assayed before each loading.

## Production Benefits Obtained

Prior to the installation of the radio communication sets it was necessary for the bench foreman to contact the assay department to determine the location of the waste and ore stations near each shovel, drive to the shovel and instruct the operators where to locate their shovel. At the same time the dispatcher at Lookout would get word to the incoming trains by calling one of the switchtenders along the line, who would in turn flag the trains down and give the engineers their instructions. Many times the locomotives would be forced to wait on a sidetrack until the shovel had moved to its new location, or another locomotive would have to be rerouted from the upper levels of the pit to the lower areas to accommodate the shovel.

**Shovel foreman Bob Mackey talks to master mechanic about a part for the shovel loading ore in background**

Quite naturally, these operations consumed considerable time. Now, however, these same changes can be made within a matter of minutes. The pit foreman, having garnered the necessary information, contacts all parties concerned by radio and the changes are completed with a minimum of waste time. Foremen also know at a moment's notice the exact nature of the material at each station as trips out of the pit to the assay department are no longer necessary.

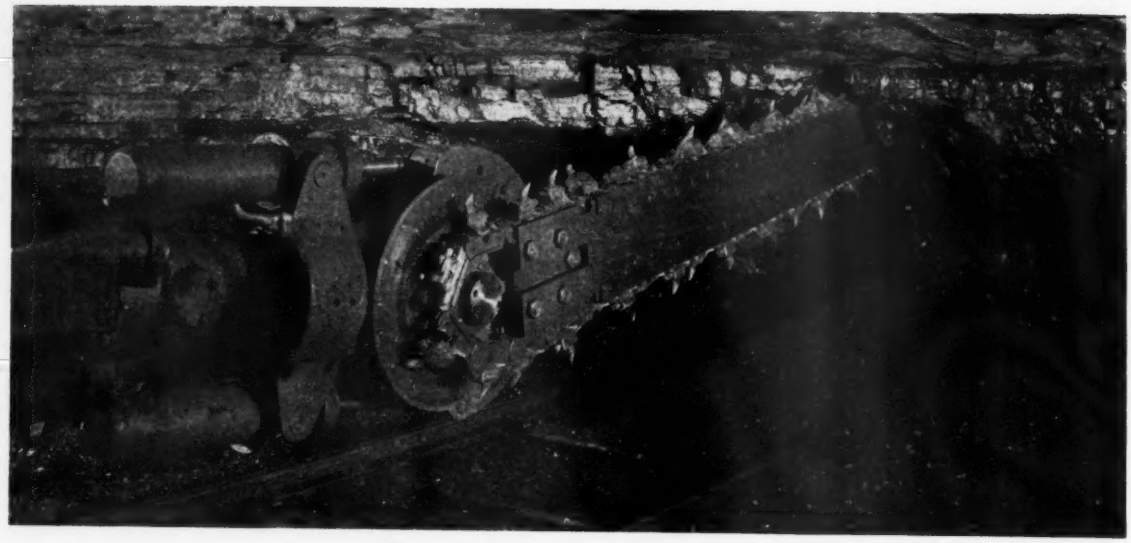
Closer communications between key men in the operations have resulted in such efficiency that foremen are at a loss to understand how they ever managed before the sets were put to use. As one of the bench foremen recently said, "I don't know how we kept this place going before. Half the time I never knew where to locate an electrician or mechanic when I really needed one. Now, by golly, when trouble comes up they know it as soon as I do."

The scientific approach to solving the communication problem at Chino has eliminated excessive waste of time and energy and has brought about a smoothness of operation that is mirrored in production records throughout the plant. With this increased efficiency has come another desired element not to be overlooked—higher morale among the men at the foreman level who shoulder the responsibility of keeping the operations on an even keel. And this improved morale is one of Chino's most gratifying results hinged upon its desire to improve communications and its methods of fulfilling this desire.

## Nevada Oil Search Ties Up Public Domain

For the past decade interest in finding oil reserves in Nevada has resulted in the drilling of several shallow boreholes some of which reported traces of oil. In recent years an intensive search by geologists of large oil companies has developed. Large acreages have already been taken up by lease from the Federal Land Office.

Since over 80 percent of the area of Nevada is open public domain, the procedures of the oil companies is to apply for a lease from the Federal Land Office. These requests are usually masked in the name of an agent. Leases are given under specified sections for five years on a ⅛th royalty of the oil produced with a 50c an acre fee for the first year—none in the second and third, and 25c in the fourth and fifth. No actual drilling is required. These liberal terms offer private speculators opportunity to take up leases as well as the large companies. Estimates place the recently leased land at over 1,000,000 acres representing a tidy income of $500,000 to the Government for the first year. Several large companies have scattered areas under lease which are in general close to the former localities considered favorable by drilling ventures conducted in the 1920's.



# How Time Studies Increase Efficiency

## Face Preparation Operations Benefit from Careful Analysis and Subsequent Changes

By JOHN K. BERRY
Production Engineer
Consolidation Coal Co. (Ky.)

YOU can't load coal if you don't get it ready. Where the coal is high, the top good and the places wide, face preparation is not much of a problem, except to see that it is done right. Loading and service haulage are the all-important considerations, and the effects of poorly laid track, bad haulageways, passed-up working places, poor cutting, drilling, dusting and shooting are readily apparent in time studies on the loader. Steps can be taken to correct the faulty operation and results checked in subsequent loader studies.

For those who do not have such easy seam conditions the problem is to get the face prepared. When this is the case, it becomes more profitable to analyze the operations than to make an immediate effort to get more production. The place to start the study is at the bottleneck—that operation which is holding up all the others. It is of little value to study an operation that is continually waiting on the one ahead.

Diagnosis is the first step in making a time study. For instance, when you go to the doctor and say "Doc, my back hurts something terrible," he doesn't whip out a knife and start operating. Instead, he examines the back, asks questions, takes X-rays, checks your record, and examines other organs that could cause the trouble. Then he decides what to do.

By the same token, the time study or series of studies on the mine operation that is giving trouble should be analyzed for the cause or causes of the low performance. Generally, the answer will be one or more of the following, and this is about the order in which the problem should be approached, for the quickest improvement, the least expense and the maximum tonnage:

(1) Excessive delays
(2) Improper method
(3) Incompetent labor
(4) Poor division of labor
(5) Inadequate equipment
(6) Insufficient labor
(7) The operation requires a fixed time and can be done no faster.

### Eliminate Excessive Delays

Excessive delay time is by far the easiest cause to spot and the easiest to correct. On a single operation, unsynchronized with any other one, to which the green light has been given, delay time should be held to under 10 percent with little effort, after taking fatigue into consideration. Obviously, if delay time on an operation consistently runs between 40 and 50 percent of the shift, and production averages 7 places, then there are 11½ places possible by doing nothing except eliminating the delays.

An examination of the nature of the delays will show what action to take. If delays are largely mechanical, repair crews must be taught that this piece of equipment must be inspected, oiled and greased, repaired first and ready to go at the start, no matter what else is down. Other machinery can be fixed while the slow operation is getting out in front.

The section foreman needs instruction if delays are caused by traffic hold-ups, conflicts with other operations, or if he is called off to do other work that stops the job in question. The foreman must also see to it that the place is left in shape so that work can start immediately.

Insufficient or poorly delivered supplies, misplaced tools or no replacements on the section for breakable ones are a frequent source of delay. This type of situation requires the attention of the mine foreman and

**Modern coal drilling by mobile machinery increases man output**

superintendent in setting up a system so this cannot happen.

## Costly Time Losses

Improper methods frequently stand out like a sore thumb in a time study, and at the same time suggest their own remedy. Recent studies on roof drilling for bolts, a current big bottleneck, gave average times for all day of 1.1 minutes and higher for "position drill from hole to hole." Yet in many single instances, time of 0.4 and 0.5 minutes were noted. Checking further, it became evident that the short times were obtained when the boom of the self-propelled roof drill was swung over to an adjacent hole, although the average was ruined by the times when the machine was trammed from one position to another, and there were far too many of these. By teaching the driller to come straight into a place, on the center bolt of a three-bolt line, swinging the boom to left and right for the side holes, a six-bolt place could be drilled with just one shift of the drill and it would be an easy straight forward shift at that. Average time for this element has been reduced by 0.5 minutes or more, giving 50 minutes and up additional work time per hundred holes drilled.

Another instance occurred with a track-mounted, two-armed coal drill. A few expert crews were drilling plenty of coal, but on many of the sections, drilling was the block to getting a reasonable tonnage. The section foremen were wanting to put more labor on coal drilling. The practice was that when the machine entered the place, the operator would stamp a hole, line up his auger, start the drill and stamp his next hole. When the hole was completed, he would swing the arm to the next hole and the process was repeated. A comparison of the productive crews with the unproductive ones showed in nearly every case that the former could swing their drill arm over and line up perfectly with the stamped hole, while the latter groped and fumbled interminably in trying to hit the spot. By using the drilling time to line the second arm and then stamping the hole where the auger hit instead of the other way around, these men were able to hold their own with the experts.

## Incompetent Labor Losses

Incompetent labor is frequently the reason given for failure of an operation to hold its place in the preparation cycle. The boss tells you, "Gus, just plain ain't worth a damn," and he may be absolutely right. But before we definitely make up our minds to that effect, in fairness to the man and also to the company, we want to be absolutely sure that Gus has had a chance to produce. Have we taken up so much of his day with delays, not of his own making, that he has had no chance? Has he been properly instructed? The section foreman has many things to see about, and, although he should spend the major portion of his shift with a bottleneck operation, the time study man can get a complete shift's picture for him.

**A mere recording of how long it takes to perform a given operation is of little value unless critically examined with respect to the time consumed in all phases of the work. No benefits are derived unless this information is used properly. On these pages a production engineer describes how the results of investigations have been applied in a modern coal mine to increase efficiency.**

In one case, bug dusting was the bottleneck on a section. The other shift was having no trouble, but this shift either bug-dusted every few places, or else slighted the job, preparing more places but making very tight coal. The bugduster, a new man on the job, was on the spot. The time study showed him to have been working hard and steady all day long. A look at the man confirmed that too. He was soaking wet. Yet not enough places had been dusted. An examination of the study showed that he had spent nearly three times as much time with the coal shovel, moving cuttings outside the cut, as he had with the long-handled shovel pulling the dust. The section foreman, who had originally given the man his tools and told him to "get it," then showed him how to attack the cut and turn the cuttings so that he would not block himself off, and dusting held its own in the cycle.

A time study helps to stimulate effort somewhat as few men care to have it on record that they are shiftless and no account, and this stimulus tends to carry over to some extent to subsequent shifts. There are also cases which show that a man is either unwilling or unable to hold up his end. When this happens, however, the decision is based on fact, not opinion, and gives a sound basis for his transfer to a type of work for which he is more suited.

## Poor Division of Labor

Sometimes, owing to change in mining conditions, a change in equipment, or the addition of some other step to the cycle, one operation becomes unbalanced and tonnage falls off. If the change is gradual, or if the old pattern has been in effect for so long that it is second nature, there is a tendency to fight it out on that line if it takes all summer.

In one section there was a development crew that had always been a good producer. As the headings advanced, the coal gradually grew higher and the parting thicker, yet the crew failed to produce any more coal per shift. What was a good performance in 68-70 in. of height was not nearly so good in 78-80 in. A time study on the loader showed tight coal to be the cause and an extra shot was added with good results. The men caught on quick, because, as the height and parting kept increasing, they added another shot and then another, so eventually eight holes were being drilled per cut in place of five. The loading time remained good, but everything was waiting on the drill.

With track-mounted cutting and drilling and tractor loading, it is necessary to remove between five and eight feet from the end of the track in a working place before the face is

shot down. It was the practice for the drill man to do this. A time study quickly showed that if the time spent on this operation were converted to drilling coal, enough places would result to give a decent tonnage. With the higher coal requiring only 12-13 places for a good tonnage, where formerly 15 and 16 were necessary, it didn't need a study to point out that the bugduster and cutting crew had much less to do than before. The duster was assigned to the track removal, while the cutter lightened the duster's work by raking the cuttings back from the face with the cutter bar, saving him some shoveling.

## Inadequate Equipment Can Cut Output

Inadequate equipment is generally the result of a change in mining methods or conditions. What formerly did a satisfactory job can no longer hold its place in the new setup. But before condemning the old equipment as no good, scrapping it and rushing out to spend a lot of money and then waiting for delivery, it is better first to check performance carefully to see if the trouble does not lie in the first four steps as discussed in the preceding paragraphs. If the answer is "no," you will then be spending your money intelligently for new equipment.

In one mine a section ran into some exceptionally hard cutting. Time studies showed that a full chain of bits was set every cut. Frequently, bits had to be spotted while cutting across the face. An everage 15 minutes was consumed per place for bit setting. Changing to tungsten-carbide bits reduced time lost setting bits to 5 minutes—100 more minutes of work time every ten places.

A section on the other side of the mine was also not cutting coal. The foreman immediately called for some of those bits to solve his problem, but time studies showed the cutter was regularly waiting nearly two hours per shift for the timber crew.

Changes from hand-held to mounted drills, from shortwall to mounted cutters can get more tonnage and reduce costs, but only if they break a bottleneck and allow more places to be prepared and loaded. If the roof is so bad or haulage so steep that cutting or drilling is continually waiting, of what use is it to buy higher capacity equipment unless, by combining jobs, the crew size can be reduced and the same tonnage obtained?

## Insufficient Labor Loses Tonnage

"If I had another man on my section I could get fifty more tons a shift." How often have you heard that? Sounds like a bargain, doesn't it? Maybe it is. On the other hand, if the man isn't necessary it could be very expensive. It's a lot easier to add a man than it is to take him back off, and if extra help is added on one section, it's only natural that sooner or later, the other sections in the mine will be wanting the same help.

In any event, it is definitely worth looking into, rather than adding a man or brushing the foreman off with a "if you'd get some work out of your crew you wouldn't need him." Either special conditions have come up making the job harder so that it needs more labor, or conditions have improsed so that more coal can be loaded, if this particular operation can be speeded up. On the other hand, the answer could lie in the points previously covered.

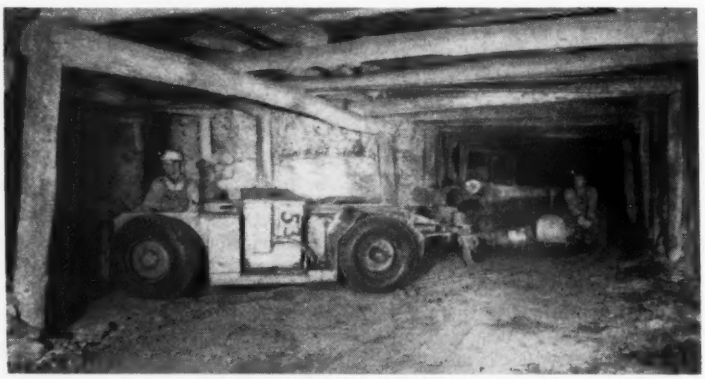
Studies on the operation in question are indicated, with consideration being also given to the ability of the other preparatory operations and the loader to keep up with the accelerated pace. Thought should also be given to how long this condition will exist, before adding a man, as the period may be too short for the crew to become adjusted to the change in cycle and then have to re-adjust to the old method.

When roof bolting first started, the manufacturers were urged to produce a machine that would haul the material around, rapidly drill the hole, swing aside while the bolt was being inserted, and possess a built-in impact wrench for tightening the bolt, making it a complete one-man operation. Several such machines have been developed. With the good top produced by bolting, the capacity of the other preparatory operations and the ability to load were so increased that time studies on the roof drill soon made it apparent that any time it was not drilling, coal was being lost. With an over-all time of 2½ to 3 minutes per hole (exclusive of tramming), including an average of 1¼ minutes for inserting and tightening the bolts, it was obvious a roof hole was being lost for every two to three bolts set. At around five tons of coal per hole, this was no bargain, so the second man was added and given a separate wrench, so the drill would not have to stop.

There comes a time when nothing more can be done. Delays are negligible, operators trained and fast, the job has been stripped of all frills, the best equipment available obtained, additional labor cannot be used to advantage, and still all other operations are waiting on some bottleneck. This can happen because of abnormally bad top, unusually hard cutting or drilling, or a limited number of working places, or, in the case of the loader, steep grades which seriously interfere with the haulage, and other circumstances.

There is no point in having a 500-ton crew on a 250-ton section. If this condition is expected to exist for any lengthy period, it is time to rebalance the crew. If time studies are available on the normal operations, the work can be intelligently distributed among the members of a reduced crew, geared to the capacity of the bottleneck. A decent tonnage per man in the section may still be obtained, even if total tons per shift cannot be improved. Another option is to have extra off-shift preparation by the slow operation. Where three shifts are the practice, it would mean, of course, going to two-shifts, with the bottleneck working three.

Time studies are a tool, not a cure. Just like when you go to the doctor, he diagnoses your case and tells you what to do. If you don't do it, you have wasted your money. By the same sign, you can have the best studies made in the world, you can have them accurately interpreted and the proper course of action indicated. But if they are allowed to sit on the general manager's or supeintendent's desk to collect dust, if they are not carried right on down to the operation itself and action taken, and followed up, you can't run a bit more coal for a penny less cost. Your money will have been wasted.



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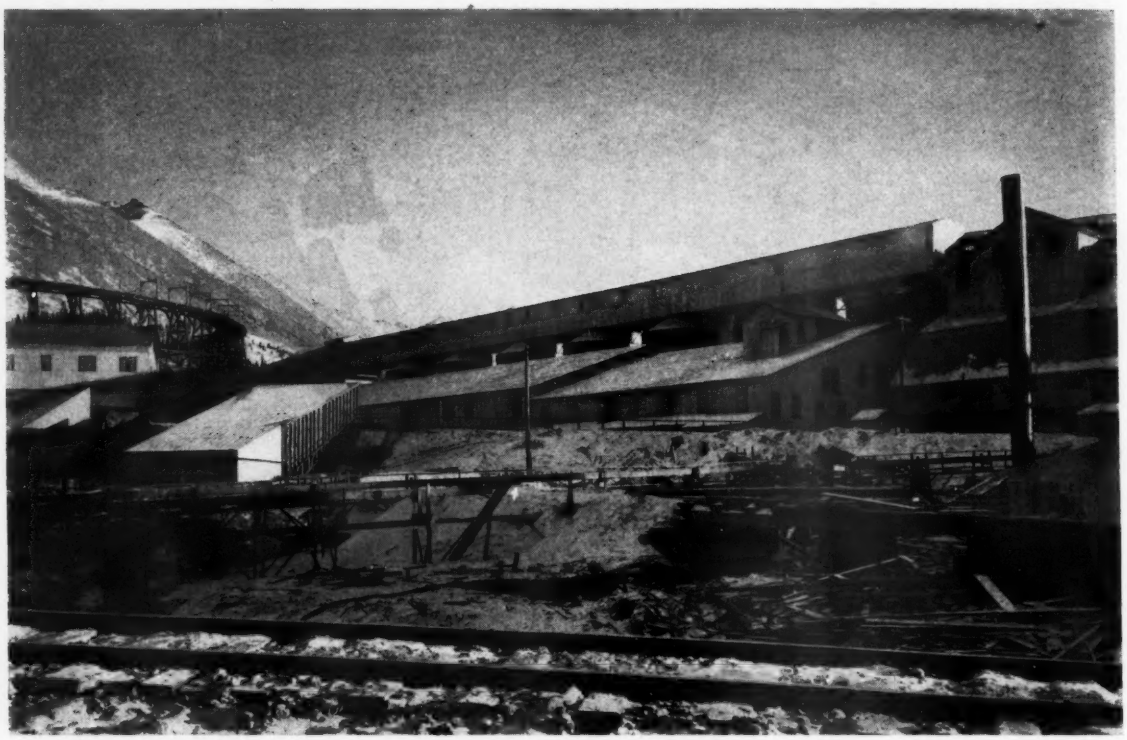


The Storke level tunnel opens up additional ore reserves that will eventually feed the Climax mill

# Insert Bits at Climax

## Tungsten-Carbide Bits Made Possible High Daily Advance and Lower Costs in Two Miles of Tunnel Driving

By C. J. ABRAMS
General Superintendent
Climax Molybdenum Co.

EARLY in 1948, the Climax Molybdenum Co., started experimenting with tungsten-carbide insert bits. Prior to that time standard Timken detachable bits were used throughout. This experimental work was carried on until the fall of 1948, at which time the devolpment of the 300 level was begun. The contract was let as a labor contract, with Climax furnishing all material and equipment for the work.

Initial test work with the insert bit gave indications that a substantial decrease in costs could be made using the tungsten-carbide bit. As a result of the early tests and information gained, it was decided to use the Ingersoll-Rand Carset bit and 1¼-in. alloy rod with the stud insert.

All the drilling in the tunnel was done with this equipment until May 1949. Difficulties with the stud connection were great and 68 percent of the rod failures were stud breakage and loosening. In May, a change to plain carbon drill rod was made using the I-R 115 thread, put on with a box tool and Toledo threader. Although performance on this rod was no better, the predominant rod failure was the shank breakage. The average life of alloy rod was 161 ft of drilling and with carbon rod was 170 ft.

Use of threaded steel reduced troubles with bit losses while drilling to the point that connection troubles were not serious. It was also found that the total cost for the attachment end was less with the threaded connection than with the stud. It could be that drilling conditions and fabrication could have been the cause of the stud failing to work at Climax.

It was thought for quite some time that it was not possible to thread Park "A" alloy rod; when tried at Climax, it resulted in damaging the dies. However, the first attempt at threading came when, due to mistaken identity, the alloy rod was mixed with the carbon rod. Threading Park "A" is quite feasible if a large mass is heated to forging heat

**Long shells and tungsten-carbide bits made it possible to drill heading in 45 minutes**

(2200 F) and the mass placed in vermiculite or other insulating material so that the cooling rate does not exceed 50-60 deg per hour. This type of treatment gives the alloy excellent machining qualities. Some of the used alloy rod was made up in this manner and in drilling 1393 ft, the average service life of the rod was 349 ft.

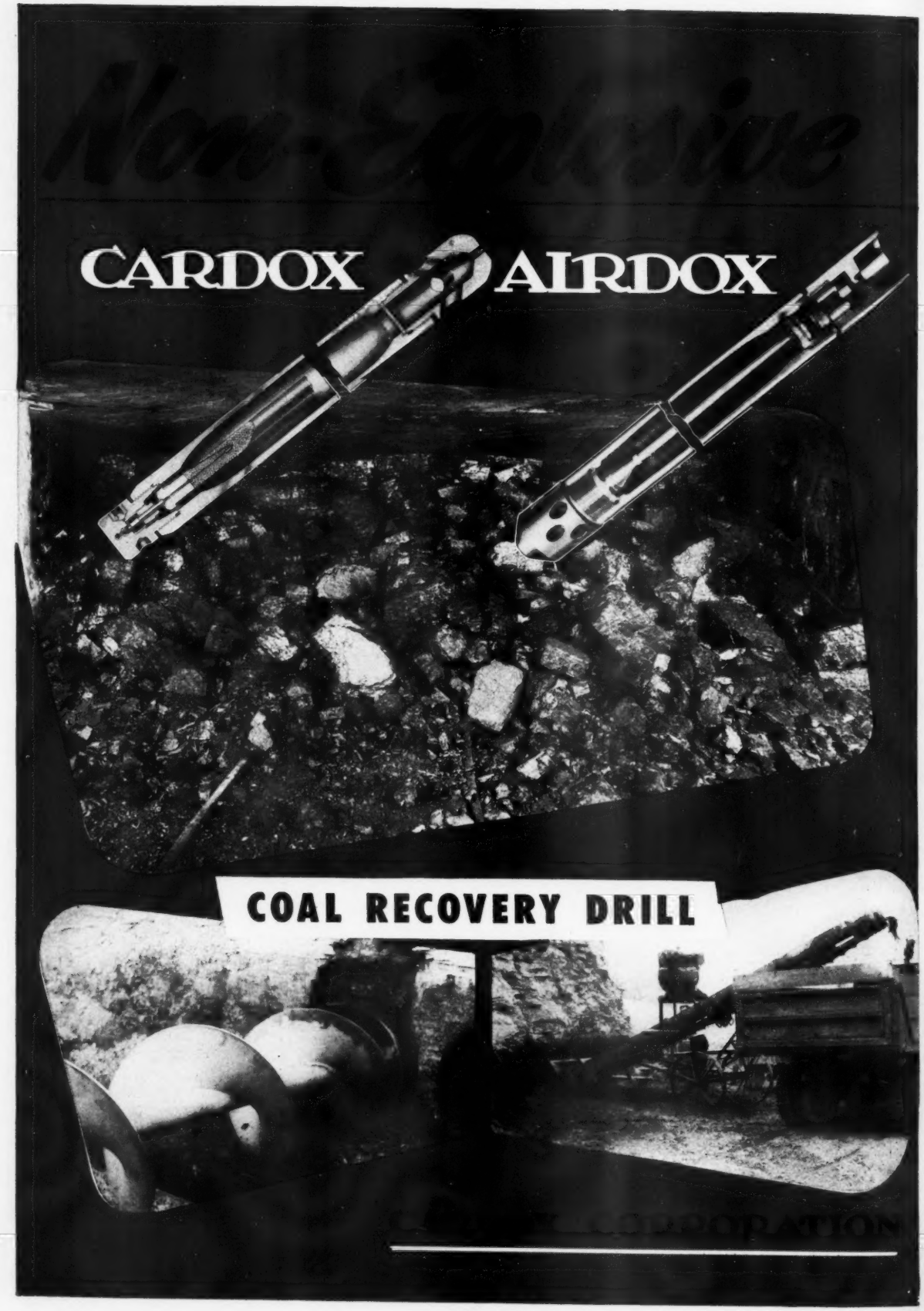
The 300-level tunnel was driven in silicified granite and gneiss that could be classified as a moderately hard rock. The equipment used was a jumbo with four 3½-in. drifters mounted on 4-ft aluminum shells. With this equipment, it was not uncommon to drill out a 10 by 14-ft heading in 45 minutes; 1¾-in. bits were used and the small holes used less powder.

The total rock advance on this level was 11,000 ft, of which 3400 ft was in a single heading adit, the remainder of the footage was in a number of headings. While driving the initial 3400 ft of tunnel, the average advance was about 38 ft per day; and after the multiple headings were reached, the daily advance was insreased to 48 ft.

In driving the 11,000 ft of tunnel, an estimated 478,000 ft of hole was drilled with tungsten-carbide insert bits. The bits averaged 319 ft for this footage, including bits lost in drilling and stolen. This gave an average cost of 4.5c per foot of hole, including sharpening material and labor. Steel costs for the period of the contract were 2.9c per foot of hole; the total cost for bits and steel being 7.4c per foot of hole. The cost per foot of drift for steel and bits was $3.205. These cost figures are only for steel and bits.

Although some other means may bring even lower costs, the 300 level was completed at a substantially lower cost for bits than would have resulted if standard detachable bits had been used.

**Platform facilitated jumbo drilling in driving 10 by 14-ft heading**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COAL RECOVERY DRILL

# MINING METHODS

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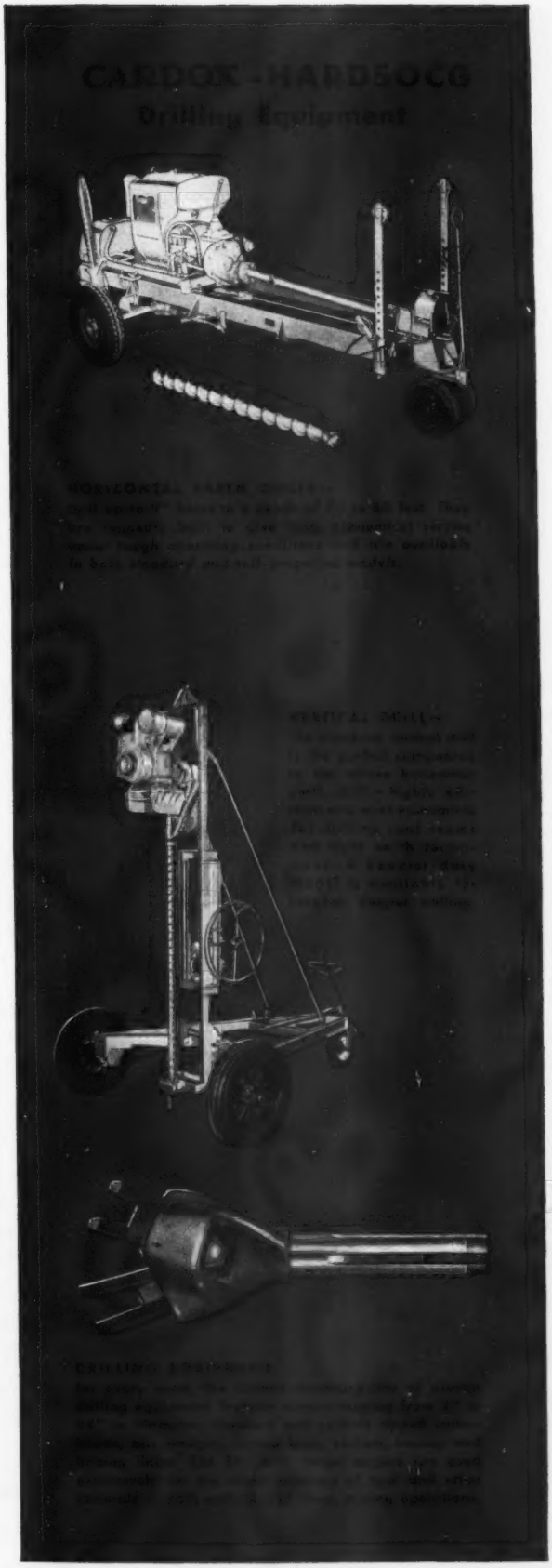
CARDOX and AIRDOX are approved methods of dislodging coal at the working face without explosion, smoke, flames or noxious fumes. *Cardox* utilizes the powerful heaving action of expanding carbon dioxide, while Airdox breaks down the coal with compressed air.

Both methods provide advantages that extend over practically every phase of production and marketing. Their mild action preserves top and ribs, produces very little dust, and eliminates shatter cracks. A decrease of from 15% to 20% in minus 2" coal, and a very large decrease in minus ¼" coal is assured when either replaces explosives. Furthermore, the firm structure of the coal withstands extensive mechanical cleaning operations and resists degradation during shipment and handling in the yards.

Factors determining which of these non-explosive mining methods will prove most efficient and economical in a particular mine may require a thorough examination of the property. Ask for a free check-up and detailed recommendations on the method best suited to your coal and conditions.

## COAL RECOVERY DRILL

The Cardox-Hardsocg "Coal Recovery Drill" makes it possible to salvage profitable tonnage in operations at which overburden removal has become too costly for further stripping. The specially designed augers, which are available in diameters ranging from 20" to 30", carry the coal in a continuous stream from the seam. At the operation shown in the left-hand picture, the coal as it is drilled from the seam is automatically loaded into trucks by means of a portable conveyor. Write today for full particulars on the records of profitable coal recovery by this low-cost method after stripping has become too costly.

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Heavy equipment removes 80 ft of cover at the Georgetown No. 12 Mine

# Stripping Equipment Maintenance

## Open-Pit Operations Depend on Maintenance Departments to Keep Heavy Machinery in Top Operating Condition

MECHANIZED industry leans heavily on the servicing and maintenance of equipment to keep production at high levels. The more spectacular angles of production are often in the limelight, but the vital service programs that insure the steady operation of production equipment are frequently overlooked. The Hanna Coal Co. in its service department at Georgetown, Ohio, has installed a system of service and records that adequately handles hundreds of units of coal mining machinery and reveals the costs involved.

The Georgetown No. 12 mine is the center of the company's stripping operations, and is in itself the largest coal stripping mine in the world. Power shovels equipped with 50-, 45-, and 20-cu yd dippers remove 3,500,000 cu yd of dirt and rock overburden a month, making available for loading over 3,000,000 tons of coal a year. To attain a daily production of more than 20,000 tons, all mining equipment must be in top operating condition 24 hours a day. The function of the service department ' to see that this condition is maintained.

Operation of the Georgetown shop is on a round-the-clock schedule. Each man is thoroughly schooled in the work he performs, and takes pride in a job well done. Slogans, such as "It's what you learn after you know it all that counts" and "Dirt is a motor's worst enemy—be clean," play their part in keeping the employes reminded of their all-important function. The shop maintains, repairs and services all types of equipment; pumps, welding machines, air compressors, service trucks, haulage trucks, power shovels, road patrols, sweepers, drills and caterpillar tractors. Engine sizes range from single-cylinder gasoline units powering 3-in. pumps to multi-cylindered Diesel outfits on shovels and tractors. The shop has both personnel and equipment to keep this wide variety of machinery operating over a four to six mile area, five days a week.

**DAILY RECORD GASOLINE FUEL OIL ISSUED**

From _____ to _____ Shift Date _____

The following Truck and/or Machines were serviced with the following SUPPLIES.

_____ Fuel Truck Driver.

This report covers ( ) Trucks. ( ) Bulldozers.( ) Maintainers ( ) Sweepers

| Unit No. | Gasoline | | Fuel Oil | | Lub. Oil | | | | TOTAL COST | ODOMETER READING |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gal | Cost | Gal. | Cost | Gal. | Cost | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Daily records provide detailed operating data

Note: Photographs furnished through the courtesy of the Caterpillar Tractor Co.

Typical of the maintenance practice is the method of dealing with lubrication in the shop and in the field. Some 100 gal of oil and grease are supplied daily but no cans are found on the job; shop oil is pumped to a tank in the shop where hose reels reach every needed point, and field trucks receive their supply from the oil shed through pump lines located outside the building.

For the many heavy duty units, a well-equipped tire shop keeps 1400 tires on the ground running daily. The big repair garage schedules earth-moving rigs on 500, 1000 and 2000 hour check-ups with a complete rebuild job at 8500 hours. These checks cover pickups, haulers and other heavy duty units requiring close maintenance after rugged work in the field.

Determining operating and maintenance costs, as well as those incurred in daily servicing, was a difficult problem. But it was essential to figure just what the array of mobile and allied equipment was costing the company, and to show what each section was doing in dollars, cents and performance. After considerable trial and error, a breakdown of preventive maintenance was formulated from which other operators may profit. The detailed cost charts of the various departments are posted daily. From the files one can obtain information on any piece of serviced equipment, including a complete record of parts, fuel and transmission, operating data and other necessary entries from the following reports.

(A) Maintenance Costs
(B) Operating Costs
(C) Daily Record Gasoline Fuel Oil Issued
(D) Bulldozer Lubrication Report
(E) Tractor Operating Report
(F) Track Odometer Readings
(G) Job Record
(H) Daily Time Report
(I) Warehouse Requisition

An interesting feature of this program is the installation of odometer card units in trucks. These tell whether the operator is lugging the engine unnecessarily, the time taken for lunch and general operating data. Time slips, fuel chart forms, lubrication data and requisition entries are given close scrutiny and entered in the monthly ledger. This procedure provides the previous day's cost and performance at noon on each day. To keep a cross check of shop servicing, operators in the field make out trouble sheets concerning their respective equipment. The service records of the Georgetown mine, from simple daily job information to major overhaul, are as complete a story on individual machines as will be found anywhere.

**Field service truck supplies stripping equipment with water and various lubricants through five pressurized lines**

**Repair shops are equipped for all types of work**

**Dozers are carefully checked in a well-equipped shop**

*Photo Courtesy of Bituminous Coal Institute*

## Two CP Drill Arms keep ahead of 3 loaders

In a West Virginia mine two CP Drill Arms, mounted separately, are keeping ahead of three loaders. Each DA-9 Drill Arm has been drilling up to ninety-two holes a shift, and could increase that performance if more working places were available.

So satisfactory has been the operation of these Drill Arms that an additional Arm has been requisitioned, with the probability that still more will be installed.

CP Drill Arm units are electrically powered and controlled. To operate, it is merely necessary to move the unit to the face, swing the drill into position and turn on the power. Drill Arms can be mounted on CP Tramdrills, trucks or mine locomotives.

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# Regrinding Carbide Insert Rock Bits

## Thorough Testing Reveals Preferred Method To Prepare Bits for Further Use

By JOHN B. BAKER
Chief Products Engineer
The Timken Roller Bearing Company

ORIGINAL attempts to regrind dull, used carbide insert rock bits were rather clumsy and inefficient. In the first place, not much was known regarding the effect of grinding heat and stress on the carbide material itself. Furthermore, there seemed to be a complete lack of uniform knowledge on the subject among the tungsten carbide manufacturers themselves. In fact, one of them warned against regrinding carbide at all and others said it was fairly safe to regrind if kept under water or suitable grinding lubricant at all times. Another stated that ordinary grinding practice would not affect the carbide at all. It was quite evident that the facts had to be found but in the meantime, the practice was followed of grinding as little as possible and always with an excess of lubricant.

In preparing the carbide inserts for assembly in new bits, the method employed was to carefully grind each insert to close size limits with the sides and bottom held flat and parallel so as to obtain as close uniformity in assembly as possible. Diamond wheels with an excess of grinding lubricant were used for these operations.

In regrinding the used and dull carbide insert bit in the field, diamond wheels are not always available, and sometimes suitable grinding machines with adequate lubricant supply are not available. Dry grinding of the carbide bits by hand on floor-stand grinders has been quite common. Varied results have been obtained as a result, but throughout the records it was apparent that footage dropped off to about 70 percent of the preceding figure after each regrind, and that the breakdown of the carbide insert was definitely accelerated.

Nevertheless, carbide bits had to be kept reasonably sharp, otherwise driving a dull bit with full throttle only increased the rate of breakdown of the carbide and tended to break out the bit body, thread and collar with resultant damage to the thread and shoulder end of the steel.

In order to get the answer to some of these problems, a test operation was set up in conjunction with the Cold Springs Granite Co. whose management and operators have always been most cooperative and sympathetic in conducting investigations. Also, the Cold Springs Granite Co. maintains good control in its bit reconditioning shop and keeps accurate records. Accelerated test results could be anticipated because the rock formation drilled is fairly uniform, hard and abrasive.

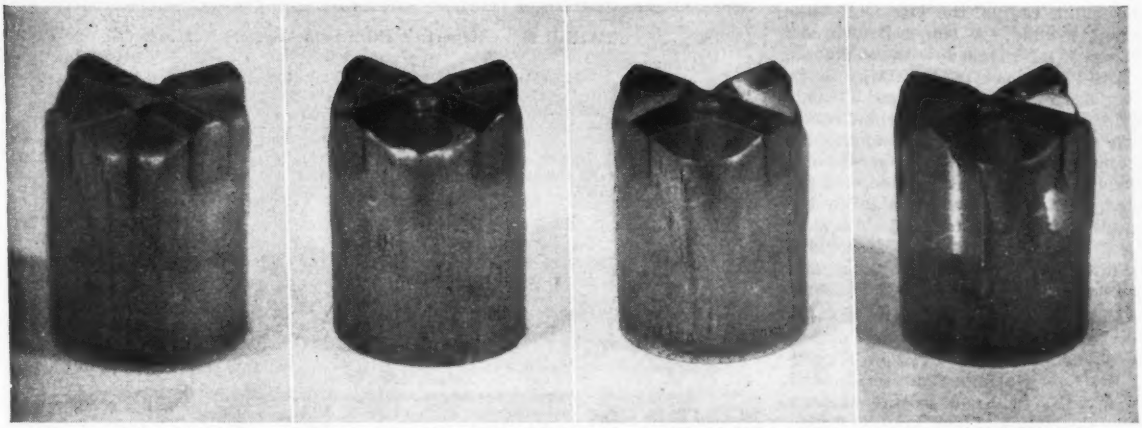
Accordingly, 24 MC 1-⅝ CS carbide insert rock bits were selected at random from stock, numbered 1 to 24 inclusive for identification purposes and then drilled to average dullness developing 64-117 ft before they were ready for regrind. Decision as to the time for resharpening was left to the operator's judgment. The bits were then returned from the quarry to the factory where they were reground the first time under controlled conditions, producing results which would simulate field conditions all the way from extreme care to extreme abuse.

It was interesting to note that 12 of these bits or 50 percent of the total showed a cracked, chipped or damaged condition of one or more of the inserts, but that in the regrinding operation seven of these bits were returned to normal condition, the crack or chip entirely disappearing. The remaining five bits went back into service with one or more inserts still showing signs of damage, a fact which was noted on the record.

TABLE I. Report of First Run—New Bits

| Test | Bit No. | New Gauge | Footage Drilled This Run | Gauge Loss This Run | Condition of Bit After Drilling |
|---|---|---|---|---|---|
| A | 1 | 1.632 | 117 | .008 | 1 Insert chipped |
| A | 2 | 1.632 | 68 | .002 | 1 Insert cracked |
| A | 3 | 1.632 | 82 | .002 | OK |
| A | 4 | 1.632 | 80 | .001 | OK |
| | | Total | 347 | | |
| | | Av. | 87 | | |
| B | 5 | 1.632 | 80 | .003 | 2 Inserts chipped |
| B | 6 | 1.632 | 64 | .003 | OK |
| B | 7 | 1.632 | 72 | .001 | 1 Insert split full length |
| B | 8 | 1.632 | 66 | .001 | OK |
| B | 9 | 1.632 | 72 | .001 | OK |
| | | Total | 354 | | |
| | | Av. | 71 | | |
| C | 10 | 1.632 | 75 | .003 | OK |
| C | 11 | 1.632 | 76 | .001 | 1 Insert cracked |
| C | 12 | 1.632 | 73 | .004 | OK |
| C | 13 | 1.632 | 70 | .003 | 2 Inserts chipped |
| C | 14 | 1.632 | 72 | .003 | 1 Insert chipped |
| | | Total | 366 | | |
| | | Av. | 73 | | |
| D | 15 | 1.632 | 72 | .004 | OK |
| D | 16 | 1.632 | 71 | .002 | OK |
| D | 17 | 1.625 | 117 | .008 | 1 Insert cracked |
| D | 18 | 1.625 | 117 | .011 | OK |
| D | 19 | 1.630 | 92 | .006 | I Insert chipped |
| | | Total | 469 | | |
| | | Av. | 94 | | |
| E | 20 | 1.632 | 79 | .001 | 1 Insert cracked |
| E | 21 | 1.632 | 80 | .002 | 1 Insert cracked |
| E | 22 | 1.632 | 88 | .002 | OK |
| E | 23 | 1.625 | 117 | .009 | OK |
| E | 24 | 1.632 | 100 | .002 | 1 Insert chipped |
| | | Total | 464 | | |
| | | Av. | 93 | | |

NOTE: Bits Nos. 1, 17, 18, 23 and 24 drilled in softer granite formation. Twelve of 24 bits show insert damage at end of first run, but seven were repaired completely on first regrind.



**An over-dull used bit seen at left is shown with one set of flutes ground, with all flutes ground, gauge ground and finished to 1/32-in. sharpness. All illustrations in this article are typical of insert bits used in an iron mine**

Before regrinding, the bits were divided into five lots and one bit out of each lot had attached to it small thermo-couples for control purposes. A Cincinnati plunge-cut grinder was adapted for the purpose on which was mounted a profiled Norton 37C80-I7V grinding wheel 20-in. OD by 2-in. face by 12-in. bore. The heat developed by the varying conditions under which these bits were reground was used for control purposes and was so recorded, as follows:

Group A—135 F to 157 F
Group B—500 F to 550 F
Group C—900 F to 965 F
Group D—1000 F to 1055 F
Group E—1100 F to 1145 F

In the fourth group, difficulty was experienced with the wheel loading with steel from the bit body. In the fifth group the breakdown of the wheel was quite evident and the color of the bit body around the inserts changed. It is assumed in ordinary practice that these conditions would be so noticeable that even the most careless grinding operator would be warned not to push the bit to the point where these changes begin and the temperature recorded above is reached.

After the regrind of the cutting edge, which was not made sharp but held to 1/32-in. minimum to 1/16-in.

TABLE II. Report of Second Run—First Regrinds

| Bit No. | Gauge After 1st Regrind | Bit Condition Before Drilling | Footage Drilled This Run | Total Footage | Gauge Loss This Run | Condition of Bit After Drilling |
|---|---|---|---|---|---|---|
| 1 | 1.606 | 1 Insert chipped | 79 | 196 | .007 | 1 Insert chipped |
| 2 | 1.620 | 1 Insert cracked | 40 | 108 | .004 | 1 Insert split |
| 3 | 1.614 | OK | 40 | 122 | .007 | 2 Insert cracks |
| 4 | 1.612 | OK | 81 | 161 | .016 | OK |
| | | Total | 240 | | | |
| | | Av. | 60 | | | |
| 5 | 1.608 | OK Chips ground out | 63 | 143 | .014 | 2 Inserts cracked |
| 6 | 1.614 | OK | 78 | 142 | .010 | 1 Insert crushed |
| 7 | 1.616 | 1 Insert split | 74 | 146 | .005 | 1 Insert crushed |
| 8 | 1.621 | OK | 65 | 131 | .026 | OK |
| 9 | 1.616 | OK | 63 | 135 | .008 | Bit collar breakage |
| | | Total | 343 | | | |
| | | Av. | 69 | | | |
| 10 | 1.615 | OK | 60 | 135 | .011 | OK |
| 11 | 1.613 | OK crack ground out | 30 | 106 | .001 | 1 Insert crushed |
| 12 | 1.609 | OK | 57 | 130 | .005 | Bit collar breakage |
| 13 | 1.623 | OK Chips ground out | 30 | 100 | .003 | 3 Inserts cracked |
| 14 | 1.602 | OK Chip ground out | 50 | 122 | .016 | 1 Insert chipped |
| | | Total | 227 | | | |
| | | Av. | 45 | | | |
| 15 | 1.615 | OK | 76 | 148 | .012 | 1 Insert crushed |
| 16 | 1.613 | OK | 78 | 149 | .013 | OK |
| 17 | 1.603 | 1 Insert cracked | 20 | 137 | .002 | 2 Inserts cracked |
| 18 | 1.592 | OK | 67 | 184 | .007 | Bit collar breakage |
| 19 | 1.622 | OK Chip ground out | 60 | 152 | .010 | 2 Inserts chipped |
| | | Total | 301 | | | |
| | | Av. | 60 | | | |
| 20 | 1.625 | 1 Insert cracked | 72 | 151 | .007 | 1 Insert cracked |
| 21 | 1.618 | OK Crack ground out | 60 | 140 | .008 | 1 Insert chipped |
| 22 | 1.621 | OK | 50 | 138 | .006 | OK |
| 23 | 1.559 | OK | 50 | 167 | | Bit broken, lost in hole |
| 24 | 1.617 | OK Chip ground out | 80 | 180 | .007 | OK |
| | | Total | 312 | | | |
| | | Av. | 62 | | | |

NOTE: Bits Nos. 9, 12, 18 and 23 out of tests due to body failure. Six bits show inserts OK (No. 24 was chipped in first run, now OK), 14 bits with damaged inserts, 3 repaired in regrinding second time.

**An average used bit**

**An average used bit with finish gauge ground is ready for re-use**

maximum radius, the bits were than gauge ground. A No. 3 Brown and Sharpe OD grinder with a Norton 37C60-I7V wheel 16-in. OD by ¾-in. face by 5-in. bore was used. Gauge ends were returned to normal condition with a 1½-deg gauge angle. No attempt was made in this operation to abuse the bits or the carbide, but the sharp corners of the carbide on the gauge were removed. The 24 bits were then returned to the Cold Springs Granite Co. for further service and subsequent reconditioning operations.

The collection of data and the supervision of the regrinding operations was handled by Mr. John Eichoff of the Cold Springs Granite Co. and by Mr. E. C. Krug of the carbide rock bit division of The Timken Roller Bearing Co. Reports indicate that on all regrinding operations following the first regrind, the bits were ground dry on a floorstand grinder equipped with two wheels 10-in. OD by 2-in. face by 2-in. bore. One wheel was profiled for grinding the face of the bit between the cutting edges, and the other wheel was straight OD for grinding the gauge or wing ends. For the profile wheel, both the Norton 37C80-I7V and the Norton 37C60-I7V were used with equal success while the Norton 37C60-I7V was used throughout for the gauge.

At the end of the first run, bits had averaged 83.33 ft with no attempt to segregate the footage of the five groups. After the second drilling run, it was noted that the average footage of the five groups ran 60, 69, 45, 60 and 62 ft respectively, with an overall average of 59.2 ft for the 24 bits, which is approximately 71 percent of the over-all average of the first run. There was no indication in these results that the degree of abuse with which the bits were deliberately treated in the first regrind operation had affected bit life one way or the other. This was particularly interesting as it had been supposed up to this time that immediate failure of the carbide could be experienced after such abuse in grinding practice.

During this run, four cases of bit collar breakage were suffered which was an abnormally high amount and difficult to explain in view of the special care and supervision exercised in regard to the steel threads and steel shoulders which normally account for the majority of this type of breakage. Nothing in the reconditioning practice would account for the collar breakage because this face was held normal while our investigation was directed entirely at the inserts themselves.

After the second regrind and during the third drilling run, the remaining 20 bits delivered an average footage to 66, 49, 59, 49 and 70 ft for the five groups respectively, amounting to

TABLE III. Report of Third Run—Second Regrinds

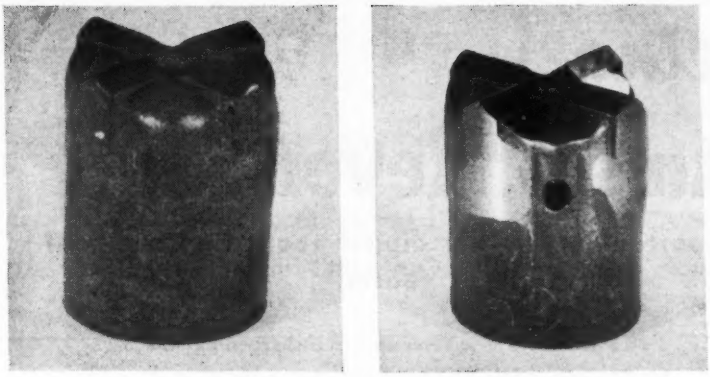
| Bit No. | Gauge After 2nd Regrind | Bit Condition Before Drilling | Footage Drilled This Run | Total Footage | Gauge Loss This Run | Condition of Bit After Drilling |
|---|---|---|---|---|---|---|
| 1 | 1.598 | 1 Insert chipped | 64 | 260 | .006 | 1 Insert chipped |
| 2 | 1.616 | 1 Insert split | 50 | 158 | .013 | 1 Insert crushed |
| 3 | 1.607 | OK Cracks ground out | 77 | 199 | .014 | 2 Inserts chipped |
| 4 | 1.596 | OK | 75 | 236 | .023 | OK—Withdrawn |
| | | Total | 266 | | | |
| | | Av. | 66 | | | |
| 5 | 1.594 | 1 Insert cracked 1 Insert crack ground out | 51 | 194 | .004 | 1 Insert cracked |
| 6 | 1.604 | 1 Insert crushed | 53 | 195 | .010 | 1 Insert crushed |
| 7 | 1.611 | 1 Insert crushed | 53 | 199 | .021 | 1 Insert crushed |
| 8 | 1.595 | OK | 40 | 171 | .002 | OK |
| | | Total | 197 | | | |
| | | Av. | 49 | | | |
| 10 | 1.604 | OK | 60 | 195 | .006 | OK—Withdrawn |
| 11 | 1.612 | 1 Insert crushed | 40 | 146 | .005 | 1 Insert crushed |
| 13 | 1.620 | 3 Inserts cracked | 70 | 170 | .012 | 2 Inserts cracked 1 Insert crushed |
| 14 | 1.586 | 1 Insert chipped | 65 | 187 | .004 | 1 Insert chipped |
| | | Total | 235 | | | |
| | | Av. | 59 | | | |
| 15 | 1.603 | 1 Insert crushed | 42 | 190 | .005 | Bit collar breakage |
| 16 | 1.600 | OK | 64 | 213 | .011 | OK—Withdrawn |
| 17 | 1.601 | 2 Inserts cracked | 50 | 187 | .019 | 2 Inserts cracked |
| 19 | 1.612 | OK Chips ground out | 40 | 192 | .017 | 2 Inserts cracked |
| | | Total | 196 | | | |
| | | Av. | 49 | | | |
| 20 | 1.618 | 1 Insert cracked | 75 | 226 | .029 | 1 Insert crushed |
| 21 | 1.610 | OK chip ground out | 64 | 204 | .012 | 1 Insert chipped 2 Inserts cracked |
| 22 | 1.615 | OK | 85 | 223 | .014 | OK |
| 24 | 1.610 | OK | 55 | 235 | .014 | OK—Withdrawn |
| | | Total | 279 | | | |
| | | Av. | 70 | | | |

NOTE: Bit No. 15 out of test due to body failure. Same six bits still show OK inserts as before. Thirteen bits show damaged inserts, but still drilling OK on remaining inserts. Bits Nos. 4, 10, 16 and 24 withdrawn from test in OK condition and held as laboratory samples.

TABLE IV. Report of Fourth Run—Third Regrinds

| Bit No. | Gauge After 3rd Regrind | Bit Condition Before Drilling | Footage Drilled This Run | Total Footage | Gauge Loss This Run | Condition of Bit After Drilling |
|---|---|---|---|---|---|---|
| 1 | 1.570 | 1 Insert chipped | 16 | 276 | .002 | 1 Insert chipped |
| 2 | 1.525 | 1 Insert crushed | 16 | 174 | .002 | 1 Insert crushed |
| 3 | 1.565 | 2 Inserts chipped | 16 | 215 | .002 | 2 Inserts chipped |
| | | Total | 48 | | | |
| | | Av. | 16 | | | |
| 5 | 1.589 | 1 Insert cracked | 16 | 210 | .002 | 1 Insert cracked |
| 6 | 1.593 | 1 Insert crushed | 24 | 219 | .003 | 1 Insert crushed |
| 7 | 1.590 | 1 Insert crushed | 24 | 223 | .000 | 1 Insert crushed |
| 8 | 1.593 | OK | 24 | 195 | .002 | OK |
| | | Total | 88 | | | |
| | | Av. | 22 | | | |
| 11 | 1.607 | 1 Insert crushed | 24 | 170 | .001 | 1 Insert crushed |
| 13 | 1.608 | 2 Inserts cracked 1 Insert crushed | 24 | 194 | .001 | 2 Inserts cracked 1 Insert crushed |
| 14 | 1.582 | 1 Insert chipped | 24 | 211 | .001 | 1 Insert chipped |
| | | Total | 72 | | | |
| | | Av. | 24 | | | |
| 17 | 1.582 | 2 Inserts cracked | 24 | 211 | .002 | 2 Inserts cracked |
| 19 | 1.595 | 2 Inserts cracked | 16 | 208 | .003 | 2 Inserts cracked |
| | | Total | 40 | | | |
| | | Av. | 20 | | | |
| 20 | 1.589 | 1 Insert crushed | 24 | 250 | .003 | 1 Insert crushed |
| 21 | 1.598 | 1 Chip ground out 2 Inserts cracked | 24 | 228 | .001 | 2 Inserts cracked |
| 22 | 1.601 | OK | 66 | 289 | .001 | OK |
| | | Total | 114 | | | |
| | | Av. | 38 | | | |

NOTE: All bits with two or more good inserts still drilling satisfactorily. Bits Nos. 6, 7, 11, 13, 14, 17, 19, 20 and 21 withdrawn from test. Bits Nos. 8 and 22 withdrawn as laboratory samples. Bits Nos. 1, 2, 3 and 5 reground for fifth run.



This sharp bit was withdrawn from service before full use. When finish gauge ground it is ready to re-enter service

an over-all average of 58.6 ft or approximately 70 percent of the first-run footage. During the third drilling run, one more bit was retired from test due to collar breakage, leaving 19 to complete the carbide insert run. Of these 19 bits, 13 showed damaged inserts in the form of chips, cracks and major crushing. Only one bit was partially repaired by regrinding, so that the 19 bits passed into their fourth drilling run with a total insert damage of four inserts chipped, nine inserts cracked and six inserts completely crushed so that in effect these last six bits were drilling on three inserts only. Gauge had decreased along with chip clearance so that during this fourth drilling run, footage dropped to an average of 16, 22, 24, 20 and 38 ft. This left an over-all average footage of 24.1 ft, or 29 percent of the original run.

After the fourth regrind, only four of the bits were run, although six others were in satisfactory condition for further drilling in so far as the carbide inserts were concerned. These bits were held out as samples for laboratory examination. The test was discontinued after the fifth drilling run because the chip clearance had now decreased to the point where the drill operator felt that further operation was not wise. The four bits run delivered an average of 22 ft each, making the total average footage for the five groups of 250, 235, 201, 223, and 263 ft respectively. The maximum footage turned in was bit number one with an even 300 ft, while the minimum footage turned in was bit number 11 with a footage of 170 excluding the bits which had failed with broken collars.

An examination of these figures shows that, despite the deliberate abuse in grinding practice with which certain groups of the bits were treated on the first regrind, they did not fail in the subsequent drilling run and that their total over-all average footage compared favorably with bits which had been given the utmost care in regrinding practice. The figures show that dry grinding of the carbide is satisfactory if done properly, although it is not recommended for the simple reason that the temptation to cool the bit suddenly in water is always present if the operator finds the bit is getting too hot to handle. This sudden change in temperature will cause cracks and failure in the carbide. For this same reason, care is recommended in grinding bits submerged in coolant, which must be applied to the point of grinding. If at the point of grinding contact between wheel and work there is no coolant, the carbide is liable to crack and fail. For this reason, we recommend the use of grinders of the type where the coolant is fed outward through the grinding wheel directly to the point of grinding contact.

This Timken bit drilled 1200 ft in medium hard rock without resharpening

TABLE V. Report of Fifth Run—Fourth Regrinds

| Bit No. | Gauge After 4th Regrind | Bit Condition Before Drilling | Footage Drilled This Run | Total Footage | Gauge Loss This Run | Condition of Bit After Drilling |
|---|---|---|---|---|---|---|
| 1 | 1.567 | 1 Insert chipped | 24 | 300 | .004 | I Insert chipped |
| 2 | 1.523 | 1 Insert crushed | 24 | 198 | .003 | 1 Insert crushed |
| 3 | 1.561 | 2 Inserts chipped | 16 | 231 | .001 | 2 Inserts chipped |
| | | Total | 64 | | | |
| | | Av. | 21 | | | |
| 5 | 1.586 | 1 Insert cracked | 24 | 234 | .003 | 1 Insert cracked |
| | | Av. | 24 | | | |

NOTE: Bits Nos. 1, 2, 3 and 5 withdrawn from test.

TABLE VI. Summary of Test—Average Footage

| Group | A | B | C | D | E | Total For Five Groups By Runs |
|---|---|---|---|---|---|---|
| First Run | 87 | 71 | 73 | 94 | 93 | 418 |
| Second Run | 60 | 69 | 45 | 60 | 62 | 296 |
| Third Run | 66 | 49 | 59 | 49 | 70 | 293 |
| Fourth Run | 16 | 22 | 24 | 20 | 38 | 120 |
| Fifth Run | 21 | 24 | .. | .. | .. | 45 |
| Total for Five Runs By Groups | 250 | 235 | 201 | 223 | 263 | |

Summary of Tests Cause of Discard

| Group | A | B | C | D | E |
|---|---|---|---|---|---|
| No. Bits Started | 4 | 5 | 5 | 5 | 5 |
| Bit Body Failure | 0 | 1 | 1 | 2 | 1 |
| Bits with Four Inserts Failed | 0 | 0 | 0 | 0 | 0 |
| Bits with Three Inserts Failed | 0 | 0 | 1 | 0 | 0 |
| Bits with Two Inserts Failed | 1 | 0 | 0 | 2 | 1 |
| Bits One Insert Failed | 2 | 3 | 2 | 0 | 1 |
| Bits with No Inserts Failed | 1 | 1 | 1 | 1 | 2 |

—*Electrical Mining*

# Announcing...

# The Amsco® Rever-SharP

**The first important reversible dipper tooth improvement made in years!**

**it's new . . .** A reversible, self-sharpening and self-hardening tooth.

**it's economical . . .** Improves digging efficiency. Lasts longer—with higher resistance to breakage. Tips made of Chromanal; Shanks and Adaptors of Manganese Steel.

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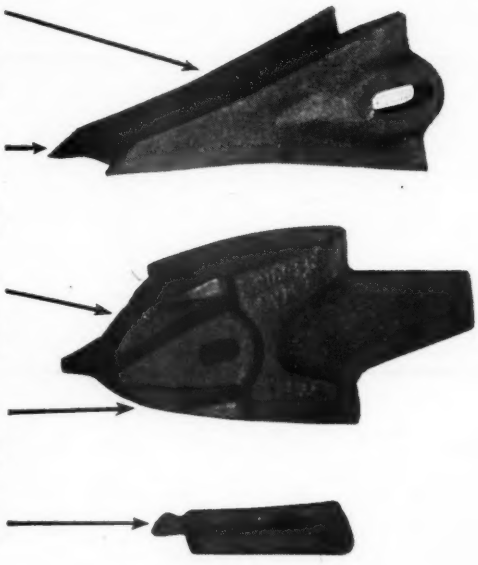
**Reversible Tip**—Simply turn the tip over when worn. A new, sharp cutting edge is ready for use. Made of Chromanal, the metal that actually work-hardens in service. *The harder you use the Rever-SharP, the harder it gets!*

**Unique Cutting Edges**—Increase service life and cutting efficiency from 50 to 200%. Reinforced and extended corners take initial impact and work-harden faster; wear is equalized along entire cutting edge.

**Special Adaptor**—Made of AMSCO Manganese Steel and designed so that extra metal protects base connections and lip from wear. Available to fit all base connections.

**Reinforced Nose**—Supported along entire length by extended ribs. Protects against bending or breakage. Tip is self-tightening as it is forced against the tapered nose during use.

**Trigger Lock-Key**—Tapered for easy insertion and removal. Rubber insert prevents loosening in service.



### REVER-SHARP ALREADY IN USE—AND SERVICE-PROVED

Acceptance of the Rever-SharP is enthusiastic—*one user reports 6 times the service of former teeth.* Get the complete facts on this new, better dipper tooth. Write today for complete information.

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# Ingenious Devices Solve Special Problems

**Coal Company Employes Devise Ways to Overcome Local Difficulties and Smooth Out Operational "Rough Spots"**

## SEMI-PORTABLE MINE CAR TRIP HOLDER

**Submitted by**
**MAX BEDNARIK**
Tipple Mechanic
Hanna Coal Co., Piney Fork No. 1 Mine
Piney Fork, Ohio

With trip holder down, cars may pass

THIS car stop has its widest application inside a mine to hold trips being spotted at a certain point by a section motor. It consists of an upright steel plate cut on each edge of the radius of the car wheel. The steel plate is welded to one leg of an angle that lies flat on the rail with the ends extending far enough each way for a car wheel to hold it flat on the rail, which in turn keeps the stop plate in upright position. The down leg of the angle, that the car wheel rests on when it is flat on the rail, is hinged to a rail splice bar with a pin hinge to permit the whole assembly to fall to the outside of the track, clear of the rail.

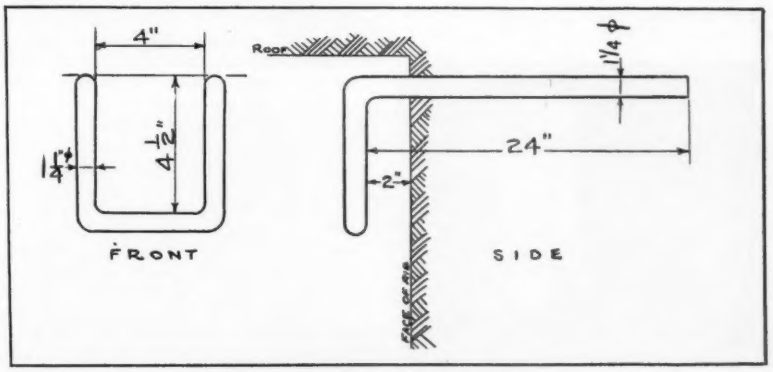
A lever arm of sufficient length, with an attached weight, is welded to the outside of the upright stop plate. This causes the assembly to fall outside in the clear of the rail when a car is removed from contact. Being attached to a standard rail splice bar, it can be installed at any rail joint and it will hold cars in either direction.

Semi-portable mine car trip holder in position

## "I" BEAM HANGERS FOR ROOF SUPPORT

**Submitted by**
**CHARLES LONDON**
(Formerly) Timberman
Rochester & Pittsburgh Coal Co.
655 Church Street
Indiana, Pa.

THESE hangers are made from 1¼-in. diam iron, a piece approximately 5 ft 8 in. long being required for each hanger. This is bent to the required shape as shown by the accompanying drawing. Two holes are drilled into the face of the rib, close to the roof, into which the ends of the hanger are inserted, hangers are placed opposite each other on both sides of the heading. When installing, a hanger is inserted on one side and the end of a beam placed in the stirrup. The other end of the beam is then raised to the roof and the second hanger slid into position, after which the beam is wedged tightly against the roof to complete the operation.



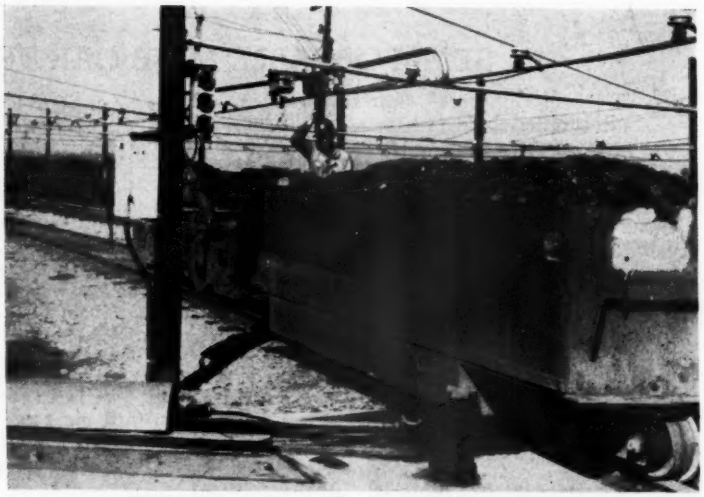

"I" beam hangers for mine headings

# PERMANENT TRIP HOLDER ON OUTSIDE MINE TRACKS

**Submitted by**
**HARRY CORONA and R. V. BOVENIZER**
General Outside Foreman and Chief Electrician
Hanna Coal Co., Piney Fork No. 1 Mine
Piney Fork, Ohio

THIS apparatus was designed for holding trips of mine cars when stopped on a grade at a predetermined point on a tramroad or tipple tracks. A single installation holds in one direction only. It consists of an arm with forked end to engage the corner of the mine car, an electric track switch throw to operate the holding arm, a mounting plate with anchor bolts for anchoring it to a concrete foundation, electric switches for operating the electric track switch throw, and a suitable group of electric colored lights to warn motormen of the position of the holding arm. It is operated by the motorman throwing a switch which energizes the solenoid of the electric switch throw, moving the holding arm out to the engaging position on the corner of the mine car. The motor can now move away, leaving the trip stand. When cars are coupled, any car in the trip can be engaged; if uncoupled, the rear car, of course, must be engaged.

To release the holding arm, the motorman couples to the trip and throws another switch, energizing the electric switch throw in the reverse direction, which withdraws the holding arm and clears the trip. Warning lights are used: a red light shows when holding arm is in engaged position, another red light also shows when or if the withholding arm is half thrown, and a green light shows when the holding arm is withdrawn and in the clear.

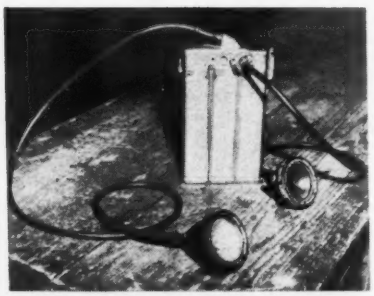


Fixed mine car trip holder is operated by motorman

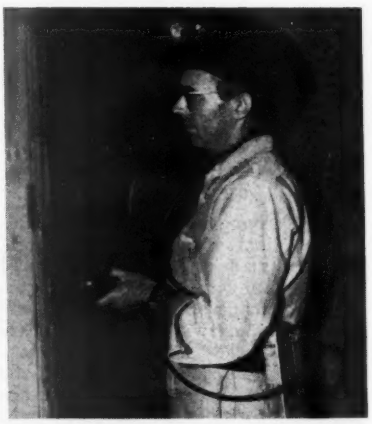
# ELECTRIC BATTERY HEAD LAMP WITH AUXILIARY LAMP ATTACHED

**Submitted by**
**FORREST THAXTON and GEORGE KINSEY**
Transitman and Rodman
Hanna Coal Co., Piney Fork No. 1 Mine
Piney Fork, Ohio

WHEN surveying while a mine is working, there are often many lights in an entry where sights are being placed. These are white lights and the rodmen also need white lights to see their way around. But, to give the transitman a sight with the white lamp, it must be removed from the hat (or the hat and lamp removed together) and a thin paper placed over the lens to subdue the glare so the transitman can see the plumb bob clearly. This process is rather awkward and the auxiliary lamp furnishes an efficient way to overcome this difficulty. The auxiliary lamp is permanently connected to the battery by a tap in the side, the cord being of such length that it can be dropped and not strike the ground when the battery is worn on the belt. The lens can be red, which breaks the glare of a white light and shows well the outline of the plumb bob. The rodman leaves his working lamp on his head and, if both hands are needed to do a certain operation, he either drops the auxiliary lamp or puts it in his pocket. It is turned off when not in use in order to conserve the battery.



Auxiliary lamp is attached to side of battery case



The auxiliary lamp offers convenience to engineering crews

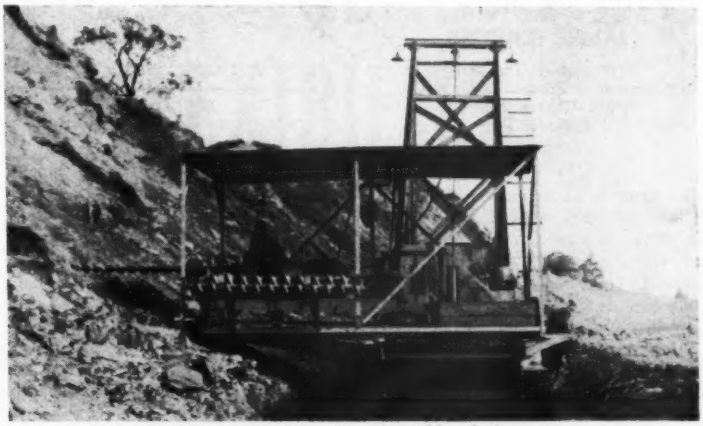
# HIGH LEVEL DRILL FOR STRIP MINING

**Submitted by**
**HOWARD A. SINGER**
Blasting Engineer
Hanna Coal Co., Georgetown No. 12 Mine
Adena, Ohio

AS a step to aid in the problems of overburden blasting, horizontal drilling was instituted by developing a "Toonerville Machine" for high-level work. This machine is mounted on a 42-T frame with two bottom and one top platform with a horizontal drill mounted on each platform, which enables drilling three holes at one time,

**The high-level drill reduces manpower and enables hole positioning to take maximum advantage of rock structure**

if desired, and on different levels depending on the structure of banks and necessity for proper fragmentation.



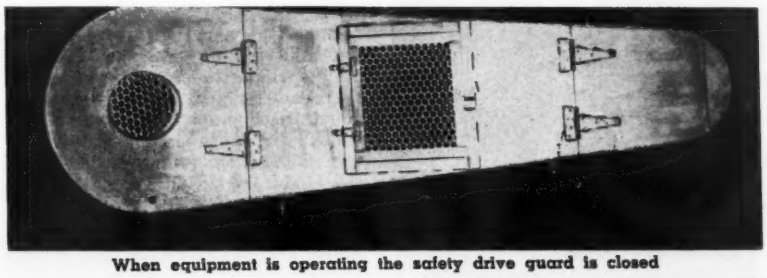
**Drilling overburden with adjustable platform rig**

The top platform will project a maximum of 16 ft over the frame for closer operation to the highwall.

The use of this machine reduced the crew from 21 for vertical drilling and blasting to five men for the horizontal operation, and the increased speed of drilling makes it possible most of the time to operate the drills one shift only.

A still later development has been made by redesigning the "Toonerville" machine. The new design has only one platform which moves vertically. A horizontal drill is mounted on the platform. This vertical movement makes possible correct drilling location for structure variations, and reduces the number of men required for the drilling and blasting operation from five to three. Better results are also due to placing the holes where desired for proper blasting with less coal breakage.

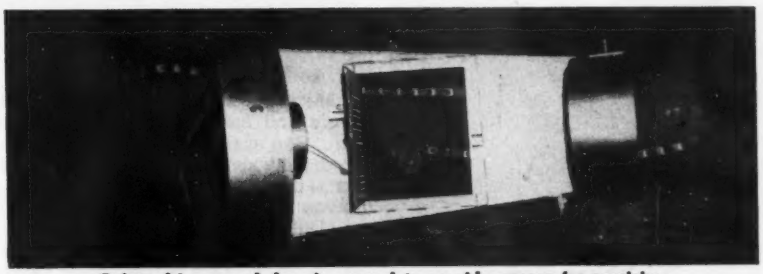
# IMPROVED SAFETY DRIVE GUARD



**When equipment is operating the safety drive guard is closed**

**Submitted by**
**OKEY HOWARD, JR.**
General Maintenance Foreman
Hanna Coal Co., Piney Fork No. 1 Mine
Piney Fork, Ohio

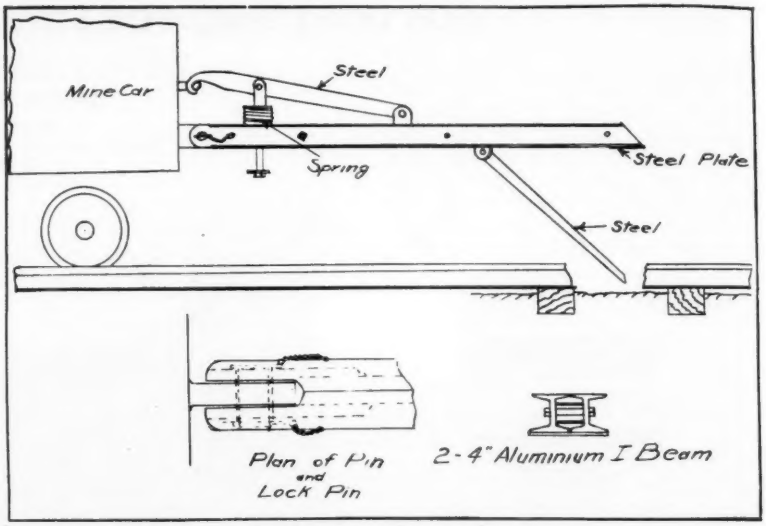
THIS guard can be made of solid plate or wire screen, as desired, and is mounted securely in place and not removed. For servicing the pulley, gears or belts, whatever the device guarded, a section is hinged large enough to give ample room for access. Each end is hinged to swing clear of its pulley and, should there be an idler pulley between the others, a door is cut and hinged to expose the idler or permit its removal. The great advantage is that the guard is never removed and left off during a repair job, nor is there a problem of handling and placing out of the way a large guard which is often heavy or bulky.



**Safety drive guard door is opened to provide access for servicing**

# ALUMINUM SAFETY CAR DRAG

**Submitted by**
**JAMES JENKENS**
(Formerly) Pumper
Rochester & Pittsburgh Coal Co.
655 Church Street
Indiana, Pa.




**An aluminum safety car drag**

THIS drag is attached to the end of the last car of a rope trip. When the trip stops, any backward motion will cause the spring arrangement to function and release the drag, which will either stop or derail the car depending on how far the car moves, thus preventing runaways. The reason for having the drag suspended and carried in a rigid, straight line position is to eliminate damage to ties and rollers when the trip is in a forward motion and to insure maximum stopping or derailing when released.

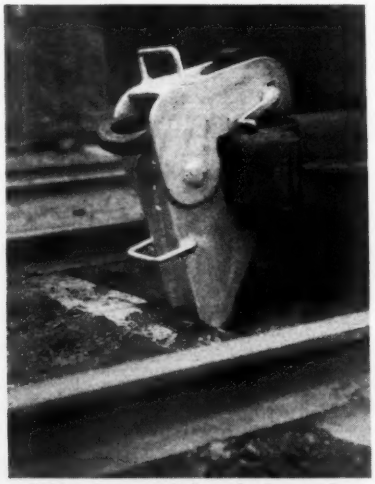
# SAFETY DRAG FOR MINE CAR HAULAGE

**Submitted by**
**J. GARLAND SKAGGS**
Mine Superintendent
Gauley Mountain Coal Co.
Ansted, W. Va.

About eight years ago, in our Ansted mine a broken swivel coupling caused a trip of loaded mine cars to run into a trip of empties at a conveyor loading station, when a conventional type stiff drag failed to stop the trip. The impact broke a rope on the car spotting hoist and derailed the empty cars, resulting in a long delay and a production loss from at least 20 men.

The safety drag is just what the name implies, and the accompanying illustration shows its design and how it operates. It has been in use eight years and has never been known to fail. One example of its effectiveness occurred when a trip of 31 loaded cars came uncoupled from a mine locomotive on a five percent grade and stopped suddenly against the drag, without doing any damage other than slip two ties in the track. This is just one of many instances of where the drag has saved us hundreds of dollars in property damage and lost production, and has prevented injury to operating personnel.

**Safety drag in trailing position on link end of car**

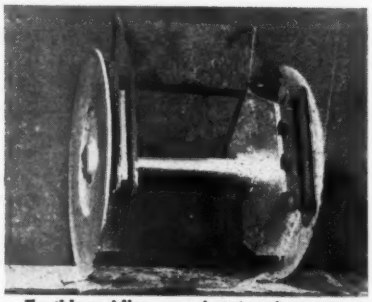


**Safety drag on link end of car after pressure is applied**

# TOOTHLESS IDLER SPROCKET FOR DRAG CONVEYOR CHAIN

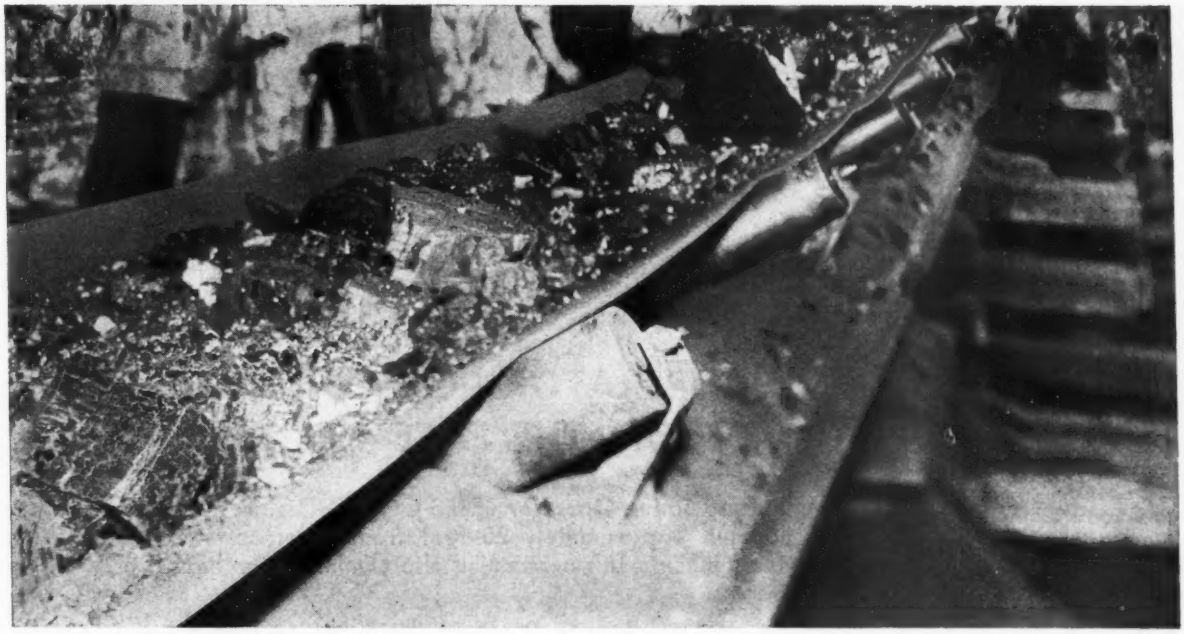
**Submitted by**
**OKEY HOWARD, JR.**
General Maintenance Foreman
Hanna Coal Co., Piney Fork No. 1 Mine
Piney Fork, Ohio

THIS innovation was brought about because the experience of sludge or fine coal building up around the teeth of the conventional sprocket caused the chain links to spread and/or unequal tension on the two chains. When the tooth is eliminated, the flat surface easily clears itself and the chain links ride the flat surface with minimum wear.



**Toothless idler sprocket for drag conveyor chain does not clog**

# NEW 4-PLY UNDERGROUND COAL BELT HAS RUGGED STRENGTH AND GREATER FLEXIBILITY



Here's the remarkable new 4-ply U. S. Giant Underground Coal Belt that's every bit as rugged as United States Rubber's 4-ply 42 oz., but with greater crosswise flexibility.

This belt is available in two styles:

*Style XN* has a working tension strong enough to handle all known belt requirements except extremely long center installations.

*Style YN* incorporates the additional strength required by extremely long center installations in use or planned.

Outstanding features of this remarkable belt include: OPTIMUM CROSSWISE FLEXIBILITY, providing excellent troughing and easy training, eliminating edge wear and spillage. CROSSWISE STRENGTH, to resist gouging and tearing. ONE TYPE FABRIC CONSTRUCTION, to equalize tension and elongation throughout the belt. ELASTICITY, to cushion shock loads and impact, prevent localized strain. FASTENER HOLDING STRENGTH comparable to United States Rubber Company's 4-ply 42 oz., which hitherto has been considered outstanding in this respect. HIGH STRENGTH AT LESS WEIGHT facilitates transportation of belt in underground locations.

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# *SAFETY Stressed in Design of COLMOL*

Here is where the Operator is stationed—well back from the face. From this position he is able to maneuver the big machine at will. This unit has a variable speed from 8′ to 25′ per minute.

(Patent Pending)

## OPERATOR POSITIONED 20 FEET FROM THE FACE–NO SHOOTING

Hazard to the Operator of the COLMOL is greatly reduced—he is located approximately 20 feet from the face where the cutting takes place. This positioning also eliminates the hazard of swinging booms.

Besides, no shooting is required with the COLMOL—it just bores into the face and starts digging. It produces a run-of-mine coal with a minimum of fines—greatly reducing the dust hazard. This continuous one-process machine permits mining with reasonable safety under roof conditions unsafe with conventional methods.

The low-type COLMOL is shown. Note the two breaker heads with 10 breaker arms on top and 5 on the bottom, providing a cutting width of 9′6″ into seams from 30″ and up.. Conveyor is 42″ wide and will raise to maximum height of 50″, allowing 38″ clearance for Shuttle Car.

Safety is just one of the many features of the COLMOL—we expect to introduce others from time to time.

- High Production
- Ruggedness
- Economy of Operation
- Clean-Up
- Timbering
- Continuity of Operation
- Enlarged Applications
- Maneuverability

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**Additional data on this low-type machine as well as Intermediate model will be sent upon request.**

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# Wheels of GOVERNMENT

## As Viewed by A. W. DICKINSON of the American Mining Congress

AS the Congressional session rolls along there is cause to feel some measure of hope in the House Appropriations Committee's treatment of the "one-package" appropriation measure, which has been cut $1,213,000,000 to a present $29.1 billion. The drive for economy on the part of Senator Byrd of Virginia, coupled with the protests of taxpayers suffering from the back-breaking tax load in the home districts, is having at least some effect. In the bill now before the House, the Department of Defense would receive $12.8 billion; Treasury $2.75 billion; Agriculture $764,000,000; Independent Offices $8 billion; Labor and Federal Security $2.2 billion; Army Civil Function $675,000,000; Interior $621,000,000; State, Justice and Commerce $1.1 billion; and Congress $56,000,000. The Bureau of Mines would receive $24,500,000; Geological Survey $19,000,000, and stockpiling of strategic and critical materials $633,000,000 in cash and $100,000,000 in contract authorizations.

### Taxation

Closing its hearings on the proposed revenue bill on March 3, the House Committee on Ways and Means began executive consideration of the Treasury's tax proposals on March 13. Minority members immediately proposed that an excise-tax reduction bill be reported and that other Administration proposals for raising compensating revenue be dropped. This was defeated by a strict party-line vote. The Committee then adopted a resolution to select for reduction or repeal, not only wartime excises but other excise taxes and, "that the Committee also aim to replace any of the revenue estimated to be lost from excise tax repeal or reduction by closing loopholes in existing tax laws, by strict enforcement against tax evaders, and, if necessary, such other tax changes as may be deemed feasible."

Meanwhile, mineral producers whose tax status would be seriously affected by the Treasury's recommendations to reduce percentage depletion rates are continuing vigorous protests to their Congressional delegations, and asking that the tax climate for mining enterprises be definitely improved to restore incentive for investment and development.

Senator O'Mahoney's (Dem., Wyo.) subcommittee on the Joint Economic Report has urged an early systematic review of present tax laws, with special emphasis on their impact on small business and on the availability of equity capital generally. Included in the recommendations are increased benefits to very small corporations; extension of special tax treatment to intermediate size corporations; a full study of the effect of Section 102 of the Revenue Code; liberalization of provisions for carrying forward net losses; treatment of venture capital corporations as investment companies for tax purposes, and revision of estate taxes.

### Social Security

Senate Finance Committee hearings on the Administration's Social Security Revision bill, H. R. 6000, closed March 23 and the Committee is now engaged in redrafting the measure. In the course of the hearings Chairman George and other members indicated their disapproval of provisions in the bill which would blanket independent contractors under the Act as "employes."

American Mining Congress witnesses led by Robert M. Searls, mining attorney of San Francisco, testified before the Committee on March 9. Those appearing in addition to Searls were H. R. Fitzpatrick, manager, Empire Star Mines Co., Ltd. of Grass Valley, Calif.; Merrill E. Shoup, president, Golden Cycle Corp., and Thomas M. Burgess, attorney, Colorado Springs, Colo.; James K. Richardson, manager, Utah Mining Association, Salt Lake City; Joe Dumont, Lark Mine, U. S. Smelting Refining and Mining Co., Utah; Ralph Hopes, Colorado Mine, Eureka, Utah; August Carino, Grass Valley Leasers Organization, Chester C. Butler, Empire Star Mine, and Albert J. Straub, Idaho Mine, Idaho Maryland Mines Corp., all of Grass Valley, Calif.

Searls attacked sections of the bill that classify mine lessees or "leasers" as employes and the catch-all section that defines an employe generally, which might well include block leasers. He explained that if the companies were required to classify leasers as employes, several hundred leasers would be deprived of their means of livelihood. He made it clear that the position which the mine owners took before the Committee conforms with the position of their lessees.

Searls was ably supported by Fitzpatrick, Shoup, Burgess and Richardson.

The five independent contractor leasers were emphatic in protesting any change in their present status, declaring that if leasers are classified as employes of the company, leasing will not continue and that many of their best men will join the ranks of the unemployed. They stressed that the model lease now in use fully protects the leasers from exploitation, that the present system is working well and that there should be no legislation which will curtail or injure mine leasing.

### Washington Highlights

**CONGRESS:** Busy on appropriation bills.

**TAX:** House to get bill around May 1.

**SOCIAL SECURITY:** Mine leasers may retain status

**INCENTIVE PAYMENTS:** House rejects S. 2105.

**DELIVERED PRICING:** Waits Senate O.K.

**COAL CONTRACT:** Signed March 5.

**COAL COMMISSION:** Requested by White House.

**MINING LAWS:** Bureau suggests changes.

Senator Dworshak of Idaho placed in the record a letter written to him by Donald A. Callahan, vice-president, American Mining Congress, showing that Idaho leasers develop and mine abandoned workings or entirely abandoned mines, and that a change to "employe" status would stop these operations with the resultant loss of a large tonnage of mineable ore, together with loss of income to the leasers.

## Incentive Payments

The O'Mahoney Mine Incentive Payments bill, S. 2105, met defeat on the House floor March 16 by a vote of 166 to 144. Previously, on March 13, the House by a voice vote had discharged the Rules Committee, which had been holding the bill for many weeks. This may be the end of House and Senate action on mine incentive payments legislation in the present session of Congress.

Briefly the measure would have provided for: (1) exploration aid to mining enterprises, through contribution by the Government to the cost of projects found to offer "reasonable promise of developing unknown or undeveloped sources of metals or minerals"; (2) conservation aid to particular mining properties, through Government contribution to the cost of maintaining them in standby condition, and (3) conservation aid through Government purchase of the product at prices which would enable the property to continue in production. Conservation aid would have been accorded only where production would otherwise be discontinued or remain discontinued under such circumstances that it probably "would not or could not be resumed when needed for the national economy or security."

## Delivered Pricing

The final conference version of the O'Mahoney Delivered Pricing bill, S. 1008, was approved by the House on March 14 and the measure now awaits approval in the Senate. Vigorous opposition is anticipated in the Senate from Senators Long (Dem., La.) and Douglas (Dem., Ill.).

This freight absorption measure now provides: (1) that it is not an unfair method of competition for a seller, acting independently, to quote or sell at delivered prices or to absorb freight costs; (2) that a seller cannot be sued by the Federal Trade Commission for quoting delivered prices or absorbing freight, when acting independently, unless the effect of the pricing practice is to substantially lessen competition; (3) permission for a seller to justify quoting different prices to different customers by showing that his lower prices are quoted in good faith to meet the equally low prices of a competitor; and (4) that the FTC in trying to prove illegal discrimination must show that there was "reasonable probability" that there would be an illegal effect.

## Coal Contract

The bituminous coal mines of the country resumed work during the week of March 6, following the signing of the National Bituminous Coal Wage Agreement of 1950 on March 5. This contract terminates June 30, 1952, but may be terminated by either operators or the UMWA on 30 days' notice on or after April 1, 1951.

The agreement provides: (1) a wage increase of 70¢ per day, upping the basic underground day wage scale to $14.75; (2) an increase of 10¢ per ton in payments to the UMWA Welfare and Retirement Fund, making the total 30¢ per ton; (3) a new Board of Trustees for the Fund consisting of Charles A. Owen for the operators, John L. Lewis for the UMWA, and Josephine Roche as the neutral trustee; (4) first payments under the new welfare levy are to be made on April 10 and on the 10th day of each succeeding month, and signatory operators are required to make payments at the prior 20-cent rate by March 15 on each ton mined prior to March 6, 1950 on which such payments have not been made; (5) welfare fund benefits are payable, as determined by the trustees, to members of the union but without any ban restricting the payments to union members only; (6) memorial periods are restricted to five days a year and the "able and willing" clause of the old contract is eliminated; and (7) the union shop is continued but with the qualification that it stands only "to the extent" permitted by law.

## Coal Commission

In response to a White House message of March 7, Chairman O'Mahoney of the Senate Interior and Insular Affairs Committee has introduced a bill providing for a study of the coal industry by a Commission of nine members. The Commission personnel would be made up of two Senators, two Representatives and five persons to be appointed by the President.

Studies by the Commission would include: (1) size and character of the coal industry necessary to the national security, health and welfare; (2) size, location and character of coal reserves and their relationship to the future of the coal industry; (3) existing and prospective employment conditions of coal mines, including wages, hours, safety factors, welfare and retirement provisions, and opportunities for steady employment; (4) existing and prospective technological means and costs of mining, distributing and using coal, and their sociological implications; (5) existing and prospective characteristics of competition among companies in the coal industry; and (6) existing and prospective markets for coal.

There is much doubt that such a study would serve any useful purpose at this time. George Love, speaking for the Northern and Western coal producers, has declared emphatically, "This coal business is not a sick industry as has been said recently. This country is one of the very few where coal mining is still in private hands operating under a free enterprise system. It carried the country's enormous needs during the war and since without Government help."

On page 29 of this issue will be found editorial discussion of constructive action which could be the real answer to the coal industry's problems.

## Mining Law Changes

The Bureau of Land Management has proposed to the National Minerals Advisory Council a number of amendments of the U. S. mining laws, which differ materially from previous Bureau suggestions. The proposals are as follows:

(1) Notices of mining claims to be filed with the District Land Office, as well as with the County Recorder as at present.

(2) Mining claims to be adequately identified with reference to established public survey points or natural land marks, the costs of survey work to be allowed as part of the annual assessment work. A system of numbering claims to be instituted.

(3) A bill of particulars as to the nature of the assessment work performed on mining claims to be filed. Proof of assessment work to be filed with the Land Office, as well as with the County Recorder as at present.

(4) Such assessment work performed in a given year to be allowed, within reasonable limits, toward meeting assessment requirements in succeeding years.

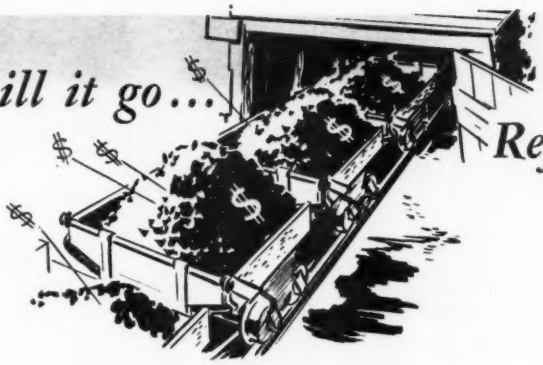
(5) All right and interest in a mining claim to be forfeited to the Governtment upon failure to perform annual assessment work or file proof thereof for three years. (Not to prejudice the right granted under the present law to other mineral claimants to relocate immediately following a year of default.)

(6) A mineral claimant whose claim has been forfeited or adversed to the Government to be denied the right to relocate, directly or indirectly, such claim or any portion thereof for a period of three years.

(7) The Government to retain a right-of-way across any unpatented mining claims for official Government use or for the use of Government permittees or licensees, subject to payment to the mineral claimant for damages, if any, caused by the use of such right-of-way to property developed on the claim for mining purposes. Mining patents to include right-of-way reservations to the Government

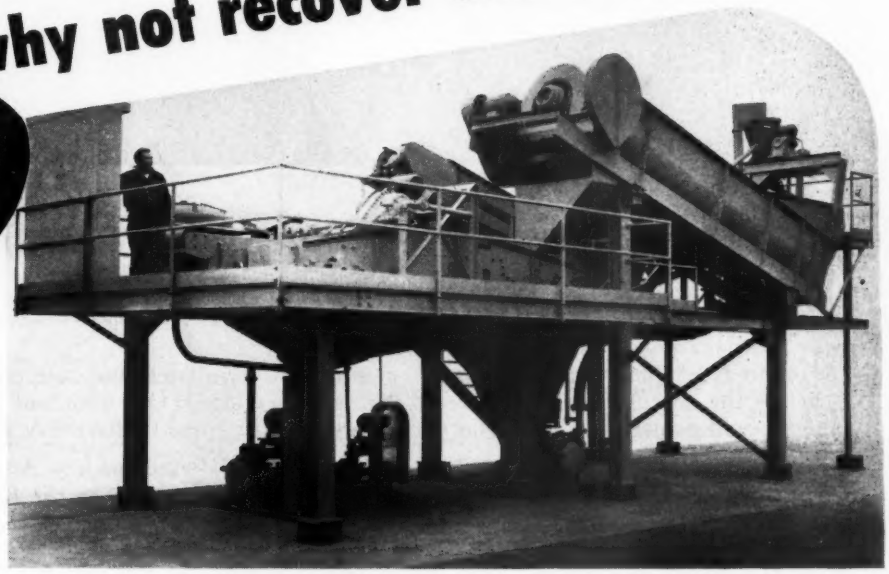
(*Continued on page* 97)

*Where will it go...* *Refuse Pile or Market?*



# You pay for it... why not recover the coal?...

**with the SWECO Heavy Media Separation Plant**



*SWECO HMS Plants Produce a Middling Product*

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Producing a middling of intermediate specific gravity in addition to the sink and float products is accomplished in one pass with a single medium cleaning circuit employing the Akins Separator. Middlings can be re-blended with the clean coal (float) to take advantage of the allowable ash content specified by the user or be crushed and recirculated to produce more clean coal. Some operators prefer to use the middlings near mining or processing site to fire boilers for heat and power.

**PACKAGED PLANTS 10-200 T/hr CAPACITIES**

Drawing on experience gained in over 34 years of equipment manufacturing and the engineering and designing of beneficiation plants, Sweco can now offer to the Coal Industry packaged HMS Plants, factory-built and ready for rapid field erection. These plants are available in 10-40, 50, 100, and 200-ton-per-hour capacities. Custom plants of larger capacities can be designed for specific conditions.

**LOW FIRST COST—LOW UPKEEP**

The initial capital investment of a Sweco HMS Plant is surprisingly low—negligible in view of the substantial savings to be realized in its application. A maximum of two men are needed to operate the larger plants, while only one man is needed to efficiently operate the smaller capacity plants. All components of the plant are standard, field-proven units that require a minimum of maintenance.

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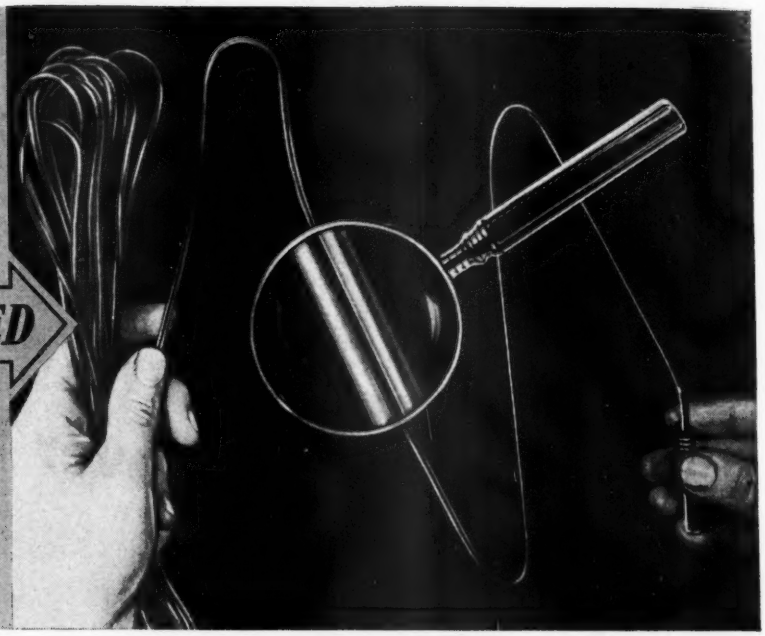

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Hundreds of good plastic insulating compounds were tried and rejected by Atlas Research before the new Atlas plastic-covered wire was developed. Our wire had to measure up to the most rigid demands of men who use electric blasting caps under every conceivable condition.

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5 ***Stands up to rigid tests!*** Compare it with other wire for these outstanding properties; and also for high tensile and compression strength; resistance to deterioration from weather, rodents, vermin.

Now available in duplex on all Atlas Manasite electric blasting caps with wires 30 feet long or more. Two single plastic-covered wires on shorter lengths.

Another outstanding contribution to explosives progress by the makers of ROCKMASTER, the original split-second delay blasting system.

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# AMC Personals

**M. H. Kuryla**, president, United States Smelting Refining and Mining Co., retired on March 1. **F. S. Mulock**, formerly vice-president and general manager of western operations, has been elected to succeed Mr. Kuryla as president of the company. **George Mixter** will have the title of executive vice-president, effective March 1.

F. S. Mulock

**E. M. Pace**, formerly with the engineering department of Inland Steel Co.'s coal mines at Wheelwright, Ky., was appointed superintendent of the cleaning plant and has assumed charge of the new preparation plant at Price, Ky. **R. A. Jiminez**, also of the engineering department, has been placed in charge of the coal testing laboratory in the new central cleaning plant.

**William M. Hayden**, manager of industrial research for Anaconda Copper Mining Co., resigned on March 1 to become president of Chemetals Corp.

**C. E. Burchfield**, with 43 years of service in the Black Star Coal Corp., has retired from the company. At the time of his retirement he was general manager of mines. **Robert Nichols** will succeed Mr. Burchfield as plant manager for the company at its property at Alva, Harlan County, Ky.

**Ben R. Coil**, former general superintendent of Miami Copper Co. and Castle Dome Copper Co., at Miami, Ariz., has been promoted to the position of assistant general manager of both companies. Coil's promotion was one of three announced by R. W. Hughes, general manager, effective March 1. Also promoted were **J. W. Still**, former mine superintendent of Miami Copper Co. to general superintendent of both companies; and **W. F. Distler**, former assistant mine superintendent of Miami Copper, to mine superintendent.

At the annual meeting of the Arizona Chapter of the American Mining Congress, **Wesley P. Goss**, vice-president and general manager, Magma Copper Co., was elected governor. **L. M. Barker**, manager, Morenci Branch, Phelps Dodge Corp., was elected first vice-governor and **R. W. Hughes**, general manager, Miami Copper Co., was elected second vice-governor.

**T. L. Kemp, Jr.**, has been transferred to No. 15 Mine of the West Virginia Coal & Coke Corp. where he is serving as assistant superintendent.

**Miles P. Romney**, for 14 years associated with the United States Smelting Refining and Mining Co. as a field engineer, resigned March 11 to assume management of a gold operation for R. C. Duvall Corp. in Cassia County, Idaho. For the time being he will retain his residence at 1166 East 5th Street South, Salt Lake City.

**William R. Cuthbert** has resigned as chief engineer of the Valley Camp Coal Co. to become chief engineer for the West Virginia operations of the Truax Traer Coal Co., Kayford, W. Va.

**A. E. Millar**, pit development superintendent with Inspiration Consolidated Copper Co., Inspiration, Ariz., has been transferred to Butte, Mont., on a temporary assignment with Anaconda Copper Mining Co. Mr. Millar directed the inauguration of open-pit mining by Inspiration. At the 1948 Metal Mining Convention and Exposition he presented a paper on factors affecting adoption of open-pit methods at Inspiration, Ray and Bagdad.

**James W. Haley** is now vice-president of the Jewell Ridge Coal Corp. and Virginia Smokeless Coal Co.

**C. A. Rockwell**, mining manager of the Calumet division, Calumet & Hecla Consolidated Copper Co., has been named assistant general manage of the division.

**L. E. Traeger**, acting superintendent of the fertilizer department of the Anaconda Copper Mining Co. at Conda, Idaho, has been made superintendent of that property, replacing **T. C. Russell**, retired.

**Donald P. Knowles** formerly superintendent of the Grandview mine of the American Zinc, Lead and Smelting Co. has resigned. He was succeeded by **John W. Currie.**

**David H. Devonald** has been elected vice-president in charge of labor relations and development for the Peabody Coal Co. **Frank L. White**, former assistant vice-president, has been elected vice-president in charge of mine operations.

At the annual meeting of the AIME, **Dr. Francis C. Frary**, director of research, Aluminum Co. of America, was awarded the James Douglas metallurgical medal for 1950. He was cited "for distinguished achievement in science and contribution to society by broadening the field of knowledge in all phases of the aluminum industry and for his notable success in directing a vast research project in this industry."

## *Attorney Named to Mining Congress Staff*

**WILLIAM I. POWELL**, an attorney from Romney, W. Va., and a former member of the West Virginia legislature, has joined the staff of the American Mining Congress to specialize on tax and legislative matters. He brings to the Mining Congress a broad background of experience from his service in the legislature in which he became well acquainted with the problems of natural resource industries.

Following one year at Morris Harvey College, Mr. Powell attended West Virginia University where he received his AB degree in 1941 and his LLB in 1947. During the war years he served with the U. S. Naval Air Corps as operations officer aboard carriers operating in the Pacific area.

His special interest in legislative and tax questions fits Mr. Powell particularly well to assist the mining industry with current problems.

**C. B. Ashby,** assistant superintendent of the Magna, Utah, concentrator of the Kennecott Copper Corp., has resigned. He was succeeded by **F. M. Barton,** formerly general mill foreman. **Neil Plummer** has taken over Mr. Barton's previous duties as general mill foreman.

**Henry F. Hebley,** director of research for Pittsburgh Coal Co. since 1939, has been appointed research consultant to the Pittsburgh Consolidation Coal Co. In his new post he will coordinate the company's activities in smoke abatement and stream purification and will cooperate with Government and civic authorities in these important fields. Mr. Hebley serves on the Coal Division of the American Mining Congress as chairman of the subcommittee on the prevention and control of surface gob fires.

**Dr. Charles F. Park, Jr.,** has been named the new dean of the Stanford School of Mineral Sciences. He succeeds **A. I. Levorsen,** who remains on the faculty as professor of geology but requested to be relieved of administrative work.

**Roland P. Price,** vice-president, P. D. Coal Co., has been appointed vice-president of the Four Seam Coal Co.

**George O. Argall, Jr.** has been named editor of the *Mining World and World Mining,* published at San Francisco. He has been a consulting engineer in Denver for several years and has served as consultant to the Colorado State Mineral Resources Board and the Colorado Mining Association.

**R. D. Squibb,** general superintendent, Youghiogheny & Ohio Coal Co., has been named general manager of the West Virginia operations of the Truax-Traer Coal Co. He succeeds **J. E. Chamness,** who has been assigned to other executive duties.

**James W. Byrkit** has been named superintendent of the new smelter being erected by New Cornelia Branch, Phelps Dodge Corp., Ajo, Ariz. For a number of years he had been superintendent of the Phelps Dodge smelter at Clarkdale, Ariz. **H. C. Hunter** will succeed Mr. Byrkit as superintendent of the Clarkdale smelter.

# —Obituaries—

**Oba Wiser,** 82, died February 4 after a long illness. Early in his career, Mr. Wiser served near Winchester, Kans., as a country school teacher. Aspen, Colo., attracted the youthful lawyer and in 1889 he was a court reporter there. He became interested in the mining industry while doing engineering work for El Paso Iron Works at Cripple Creek.

After service with a number of mining companies, he joined the Utah Copper Co. in 1908, as a metallurgical engineer and remained with that organization until 1911. Thereafter he spent three years with the Ray Consolidated Copper Co., and five years with the Chino Copper Co. At the end of World War I he joined the staff of the Republic Mining & Milling Co., and remained there until 1921, when he became associated with the Metals Exploration Co. From 1923 to 1943 he worked with the Howe Sound Co. Upon his retirement in 1943 he was retained as a consultant for that company.

**William A. Wasley,** 64, concentrator superintendent for Cananea Consolidated Copper Co., died at Cananea, Sonora, February 7. He had been a member of the Cananea Consolidated staff since 1944.

**Walter W. McMillan,** 67, chemist for Magma Copper Co., Superior, Ariz., died February 3. McMillan had spent 34 years with the Phelps Dodge Corp. at Morenci before joining the Magma organization in 1946.

**Walter Bledsoe,** 74, died March 1 at Miami Beach, Fla. He had been associated with the coal mining industry for 40 years in all of its phases from production through sales and at the time of his death he was president of his company.

The Bledsoe company owns and operates Kentucky Ridge Coal Co., New Jellico Coal Co., River Ridge Collieries, Block Coal and Coke Co., and Weyanoke Coal and Coke Co. Other mines are operated by the company in Indiana and Walter A. Bledsoe & Co. serves as distributor for 35 mines located in North Carolina and Illinois. Mr. Bledsoe was interested in Snow Hill Coal Corp. and was a director of Midland Electric Coal Corp.

**Tasker L. Oddie,** 80, former Nevada governor and senator died on February 17 in San Francisco. He was governor from 1911 to 1915 and senator from 1921 to 1933. He was a joint discoverer of the famous Tonopah gold and silver field before the turn of the century. He also helped develop other mines, including those at Goldfield, Nev.

**Alfred Strong Lewis,** 68, consulting engineer of Goldfield, Ariz., died February 5 following a short illness. At the time of his death he was directing the development of the old Goldfield mine, east of Mesa, Ariz., for the Goldfield Mines Syndicate.

**J. R. Robinson,** 84, founder of the Robinson Ventilating Co., Pittsburgh, Pa., died March 2. Mr. Robinson was leader in development of mine ventilation systems and equipment and was author of the text "Practical Mine Ventilation."

**Frank R. Short,** 74, died in Atherton, Calif., last November. He spent a long and useful life as a specialist in the examination of auriferous gravels and in the operation of gold dredges.

For many years he was associated with the Natomas Co. as a consulting engineer. He was associated with the Guggenheim interests in various parts of the world and took an active part in the development of the Bulolo and Pato properties. He was a director of the Placer Development Ltd. and Bulolo Gold Dredging Ltd. at the time of his death. Previously, he had been a director of Pato Consolidated Gold Dredging Ltd.

Mr. Short was an outstanding mining engineer who had contributed greatly to the development of the mining industry. His passing leaves a vacancy that will not be easily filled.

**Amos D. Hatton,** 90, died in February. Mr. Hatton has been given credit for a great part in the mining development of the Webb City portion of the Joplin District and in the opening of the Oklahoma district at Hattonville, later Commerce, Okla.

**John A. Tallon,** former mayor of Park City, Utah, and mill superintendent of Silver King Coalition Mines Co., died in Salt Lake City recently. He had been employed by the company for almost 50 years and had been mill superintendent 31 years.

**Dr. Horace W. Gillett,** 66, former director of Battelle Memorial Institute, died March 3 near Nicholasville, Ky. Dr. Gillett was one of the world's foremost metal scientists and a one-time associate of Thomas Edison. An internationally known authority on metallurgy, he was frequently referred to as the dean of American metallurgy. He was the inventor of numerous metallurgical processes and author of scores of books and articles on scientific subjects.

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**... When long-range Bucyrus-Erie walking draglines like this 8- to 12-cubic yard 500-W go to work! Bucyrus-Eries have long reach and big capacity plus the proper balance of speeds and power that means smooth operation, instant power response for perfect control and a fast productive cycle. Each model is carefully designed to suit its work requirements.**

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**Bucyrus-Erie walking draglines work on a solid foundation, the center of gravity shifting only within predetermined, controlled limits. This keeps rim pressures low, prevents "coning" under the circular base and contributes to the fast operation that means sustained high output.**

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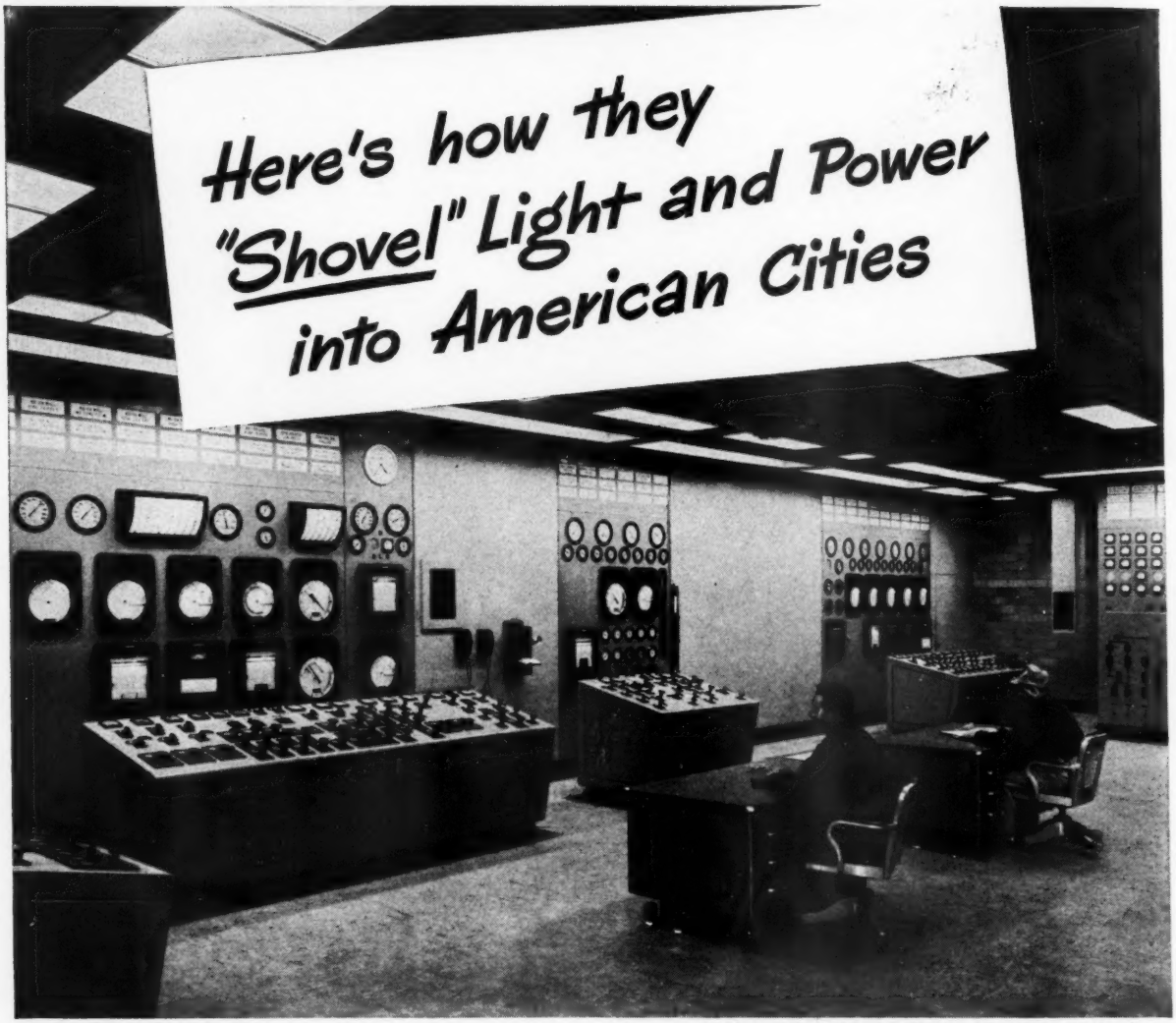


*Photo of Mitchell Station, West Penn Power Co., Pittsburgh, Pa.*

**Remember back** when the brawniest men in town were the fellows who stoked the powerhouse boilers? Well, today they wear uniforms or business clothes, and sit quietly alert, like the men shown above. For from the control panels around them, they not only operate the turbines providing a city with light and power, they also feed giant furnaces with powdered coal—at the twist of a wrist.

Today, in many factories, central heating plants and huge electric generating stations throughout the country, specially prepared coals are helping to deliver more heat and more kilowatt-hours per ton. Indeed, mine operators have built million-dollar preparation plants, where coal is washed, graded, blended and treated to meet the requirements of every type of combusion equipment.

In modern equipment, coal is making possible the generation of as much as 750,000 lbs. of steam per hour from a single boiler. No wonder coal is now being used to generate almost two-thirds of America's electric power.

**Modernizing** America's bituminous coal mines means replacing "pick and shovel" mining with machines. Today more than 91% of production is mechanically cut and 64% is mechanically loaded. And among many new preparation plants now under construction is one designed to wash and grade coal for specific uses at a record rate of 2,000 tons an hour.

Largely as a result of modernization by progressive management, the American miner's average daily output is five times greater than that of the British miner and his take-home pay is higher than that paid by any other major American industry.

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**BITUMINOUS COAL INSTITUTE**

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**WASHINGTON, D. C.**

**BITUMINOUS COAL . . . LIGHTS THE WAY . . . FUELS THE FIRES . . . POWERS THE PROGRESS OF AMERICA**

## Norton Mine Earns Safety Award

A certificate of honor was presented to the West Virginia Coal & Coke Co. by the Joseph A. Holmes Safety Association for extraordinary achievement in safety at its Norton No. 2 mine. Nearly 2,000,000 tons of coal have been produced with almost 2,500,000 man-hours of labor, without a single accident.

## Big Sandy-Elkhorn Meeting

On February 25 the Big Sandy-Elkhorn Coal Mining Institute held its annual meeting at Wheelwright, Ky. Approximately 300 members and guests were present. The high-point of the program was the presentation of gold lapel buttons to foremen with notable records of service without lost-time accidents occurring under their supervision. Recipients of this award were N. L. Akers, Ersel Ratliff, H. C. Hatfield, T. R. Simpkins, Dewey Looney, Willie Baker, W. A. Pack, Oscar Brafford, and Raymond Ratliff.

Mine 207 of Consolidation Coal Co. (Ky.), Division of Pittsburgh Consolidation Coal Co., was awarded a plaque for having the best safety record of "Class A" mines with membership in the Institute during 1949. The Kentucky Elkhorn Mining Co. was awarded a plaque for having the best 1949 safety record of "Class B" mines. Elkhorn Coal Corp.'s Jackhorn mine was awarded a plaque for having mined 1,265,870 tons without a fatal accident.

New officers were elected for 1950 as follows: John L. Coyer, president; C. L. Sherman, first vice-president; Ballard Plummer, second vice-president; A. M. Ayers, third vice-president; and J. H. Mosgrove, secretary-treasurer. Fourteen directors were elected.

## Synthetic Fuel Costs Lowered

In his annual report to Congress on achievements of the Bureau of Mines in the field of synthetic liquid fuels, Secretary of the Interior Oscar L. Chapman said that refined products now could be produced from oil shale and coal at actual costs averaging 7.3c and 10.8c a gallon, respectively. If a profit of six percent on the average unamortized capital investment is added, plus income taxes, the wholesale price for products at the plant would average 9c a gallon for those from oil shale and 14.5c for those from coal.

Secretary Chapman stated that a synthetic liquid fuels industry is sure to come and, that with more than half of all the fuel energy used in the United States now being provided by petroleum and natural gas, the security of our liquid-fuel position would be greatly enhanced if the supply could be based in an increasing degree on oil shale and coal, which comprise more than 95 percent of our total fuel reserves.

He cited that the trend of the last three decades has been in the opposite direction. Since 1920, coal consumption has dropped from about 6 tons per person to 4½ tons, while oil and gas usage has increased greatly.

It is estimated that approximately $240,000,000 would be necessary for the construction of commercial plants and pipelines for the production of 50,000 barrels per day of liquid fuel products from shale-oil. A modernized coal-hydrogenation plant producing 30,000 barrels per day was estimated to cost approximately $250,000,000.

## Venezuelan Discovery Adds to U. S. Steel Iron Ore Reserves

At the January 24 hearing before the Joint Committee on the Economic Report, U. S. Steel Corp. told the story of its important discovery, in 1948, of an immense iron ore deposit in southeastern Venezuela. The find consists of an iron ore range, including a mountain of ore called Cerro Bolivar, believed to be as large in tonnage as the famous Hull-Rust mine in the Mesabi Range of Minnesota.

A new subsidiary of U. S. Steel Corp. was organized, the Orinoco Mining Co., to undertake the development of the Venezuelan ore property.

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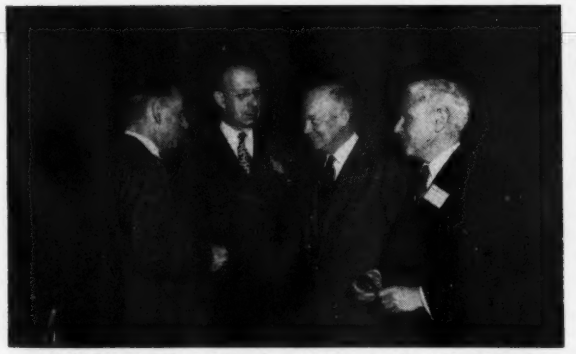
# AIME 1950 Annual Meeting



**(Left) Director James Head, outgoing president Dr. L. E. Young, General Eisenhower, and 1950 AIME president Dr. Donald H. McLaughlin. (Right) General Eisenhower brought an encouraging message to the welcoming luncheon**

MORE than 3000 members, ladies and guests attended the 170th General Meeting of the AIME held February 13-16 in New York City, with headquarters at the Hotel Statler. There were 70 meetings on the program that covered every phase of the mineral industry, including sessions on coal, geology, industrial minerals, mineral economics, mineral industry education, mining methods, petroleum, and mineral beneficiation.

A series of symposia was held on such topics as the application of geology to mining operations, fine coal cleaning, mill management and petroleum production, with well informed participants who presented details based on their intimate knowledge and experience.

The first high point of the meeting was the Welcoming Luncheon on Monday, February 13, when General Dwight B. Eisenhower, president, Columbia University, gave high praise to the self-sufficient individuals from whom the present day miners inherit those traits that foster individual enterprise.

The General stated that, so long as we adhere to the principles of dispersion of power, human dignity and individual freedom, we need not fear some governmental concern with individual enterprise and well-being. He said there was a danger that "our doing of good may finally result in doing more harm than perhaps we could do in any other way."

On the Monday afternoon Mineral Economics Session, Representative Christian A. Herter said that there was a growing prospect that President Truman's "Point Four" proposals will aid the development of other countries and be of great value. He cited programs in Iran, Colombia and Brazil as successful examples. Mr. Herter warned against "hand out" programs that might antagonize other nations and create situations in which new investors could gain unfair advantages over existing ones. He said that Government money should be invested only where private enterprise could not function, and then only through sound operations by the World Bank and the Export-Import Bank, which do not have surplus funds. On the same session, Charles H. Burgess, director, Strategic Materials Division, ECA, urged greater participation by American mining interests in the ECA program.

More than 250 technical papers were presented at the four-day meeting and the wealth of unscheduled discussion added materially to the many benefits obtained from attendance at the technical sessions.

A series of luncheons offered a splendid opportunity for informal discussions and a chance to greet old friends. Fine entertainment was had on many occasions. On Monday night the Dinner-Smoker featured a good meal in the Statler's ballroom plus a 12 act revue. The informal dance on Tuesday evening gave the ladies a chance to join their partners in an old-fashioned square dance.

Wednesday was a big day and the climax of the Annual Meeting. It started off early wtih the savory "Scotch Breakfast" of the Minerals Beneficiation Division and concluded with the 1950 Annual Banquet with chairman and toastmaster Dr. L. E. Young, president of the AIME for 1949, presiding. Those seated at the speaker's table were introduced and medals and awards were presented to a series of recipients.

Donald H. McLaughlin, president, Homestake Mining Co., was inducted as president of the AIME for 1950. Dr. McLaughlin, in a brief address, spoke of the relationship of mining engineers and security. He said the mining industry and related fields of endeavor "are no place for anyone who wants security above everything else." He added that some provisions for personal security are to receive reasonable recognition "but when security for all becomes the dominant consideration of both the electorate and the Government, and when the promised benefits are so comprehensive that a vast segment of the population might be induced to lessen its effort to support itself fully and simply to relax and enjoy what comes its way, a most unhappy moral condition is likely to result."

Inflated dollars were also discussed by Dr. McLaughlin who said that if we had an honest currency, backed by gold, the effects of some of our strange Federal financing would be revealed.

In considering the future of the mining industry he expressed the thought that "we may run out of this or that element in cheaply recoverable forms, but when this happens other ways and means, controlled by the stern effects of supply and demand will surely be worked out." In closing Dr. McLaughlin congratulated his generation for having persisted into this age and congratulated the younger members of the Institute for the prospects they have.

## BCR Holds Annual Meet

At the annual membership meeting of Bituminous Coal Research, Inc., on February 9 in Cincinnati, all officers were reelected. They include J. B. Morrow, president; R. H. Sherwood, first vice-president; Dr. Harold J. Rose, vice-president and director of research; M. L. Garvey, treasurer; C. A. Reed, secretary; and J. F. Hanley, assistant secretary-treasurer. An additional vice-presidency was created and Barton R. Gebhart was elected to that post.

The February 9 meeting included talks by George A. Lamb on "Facing the Facts in Fuel Trends" and a report on BCR's accomplishments by Dr. Harold J. Rose. Stephen Krickovic, chairman, BCR's mining advisory group, spoke on the progress of the mining development program in devising a continuous coal mining machine.

## Safety Program Expanded

The West Virginia Department of Mines recently announced an expanded safety program. Arch J. Alexander, chief of the department, stated "For the first time in the history of the state, we have an experienced safety commission studying reports of all mining accidents of the past four years and making plans to prevent accidents in the future." Findings and suggestions of the committee will be made public for the use of all miners and operators in West Virginia.

Five new mine rescue trucks are scheduled for delivery to the bureau this spring. When not engaged in rescue work they will be utilized to promote safety education in mining communities.

## British Anthracite Program

A modernization program is now under way to revitalize Britain's anthracite production which fell from 6,000,000 long tons in 1934 to 3,000,000 long tons in 1948. Vast sums have already been spent including a £400,000 expenditure in the Cefn Coed colliery in South Wales. There haulage, underground workings and the surface layout have been rearranged. New "dry" or pithead facilities have been provided for 1200 men. At this property the application of modern mining and haulage equipment is expected to increase output from 130,000 long tons to 500,000 long tons per year.

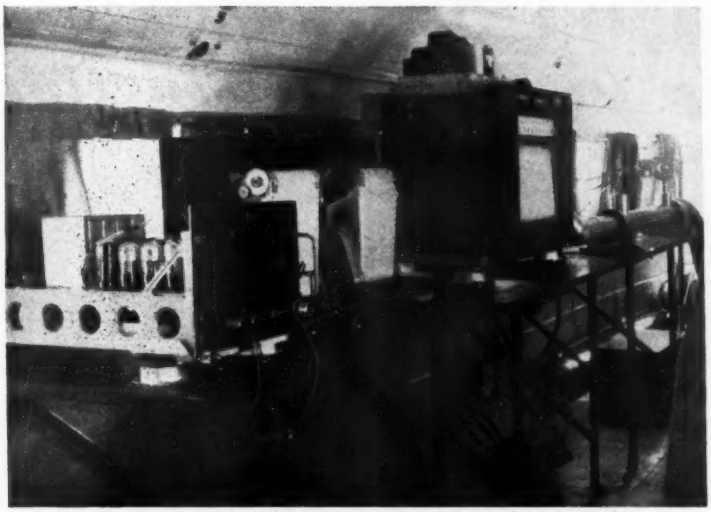
Open-pit mining is becoming more widely used and 600,000 long tons were produced by this method in 1949. Exports of British anthracite are on the increase with the product of open-pit mines aiding materially to bolster supplies.

## Blood Tests for Safety

At the Carswell mine in McDowell county, W. Va., a blood record of employes has been established and has served to speed up securing blood donors to save lives. One record of the blood type is kept at the mine, the other is given to the Red Cross and each employe carries a record card containing the data.

Blood typing of all mine employes of Eastern Gas and Fuel Associates has been advocated by Major C. R. Stahl, head of the accident prevention department of the coal organization.

## Airborne Uranium Search



Airborne equipment detects radioactivity from plane in flight

Under a cooperative program with the Atomic Energy Commission, the U. S. Geological Survey has been experimenting with equipment for locating radioactive ores from mobile equipment including light trucks and planes.

To increase the speed of prospecting, one arrangement calls for two 42-in. Geiger tubes mounted on the roof of a car. This equipment permits routing prospecting along roads at an average speed of 30 mph.

A Geiger counter housed in a probe about one inch in diameter has been designed to conduct subsurface prospecting in exploratory drill holes.

A method used for determining the position of an observation, and recording the data obtained by aeromagnetic surveying has been incorporated into a method of airborne prospecting now in the developmental stage.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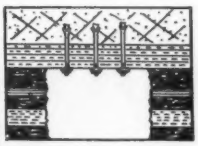

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Drill holes down to 1¼" diameter with Rock-Bit's Intraset Drill Steel. Supplied in all popular sizes, with shanks to fit any hammer. The tungsten carbide tip cutting edge steps up drilling speeds 3 to 1 over conventional types, to reduce drilling costs.

After two years of field tests, involving 25,000 pieces of Intraset steel, the life expectancy of Intraset has shown an increase of 100 to 1, in comparison with a steel bit, and in some operations 200 to 1. One piece construction—no threads.

Put our broad experience with suspension roof supports to work in cutting your costs—boosting your output. Write us today! Rock Bit Sales & Service Co., 2514 East Cumberland St., Phila. 25, Pa. *Branch:* Asheville, N. C. *A complete Line of Pneumatic Tool Accessories.*

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## ECA Aids Danish Coal Production

Under ECA's technical assistance program, Henning J. K. Marstrander, coal mining engineer of the U. S. Bureau of Mines, is conducting a three-months' study of mining operations in the Danish-owned Faroe Islands. Recommendations will be made to the Danish Government for methods to improve the efficiency of mining operations with the object of increasing production from a current 12,000 tons to 48,000 tons annually.

## Accident Prevention Awards

At the annual safety meeting for supervisory employes of the Consolidation Coal Co. (Ky.), Division of Pittsburgh Consolidation Coal Co., engraved gold pocket watches were presented to Foremen N. L. Akers and Rex Lawrence. They had worked for six years underground without an employe under their supervision suffering a "lost time" injury. Foremen Willie Baker, R. D. Kyle, Dewey Looney and Arnold Kelley also were awarded watches for attaining the same record during the past five years.

Gold lapel buttons were awarded to 42 other foremen for working one, two, three and four years underground without employes under their supervision having "lost time" accidents.

S. M. Cassidy, president of the company, addressed the foremen, superintendents, department heads, executives and guests present, expressing his appreciation for the fine accident prevention work being carried out.

## B & O Plans New Ore Pier

The B. & O. Railroad has awarded a contract to the Dravo Corporation for installation of a $5,000,000 ore pier in Baltimore Harbor to handle bulk imports of iron, manganese and chrome ores. The new pier will be the largest in the world and will be capable of the most rapid unloading of ore vessels.

## National Minerals Advisory Council Meets

Since enlargement of the National Minerals Advisory Council from 33 to 44 members, the newly formed Council held its first meeting on February 10 in Washington, D. C.

The new members are: Alan M. Bateman, Arthur H. Bunker, Philip L. Corson, Donald M. Davidson, Evan Just, Elton Hoyt, II, Zay Jeffries, Ira B. Joralemon, Philip J. Shenon, Philip Kraft, Frederick R. McIntosh, William W. Mein, Jr., F. S. Mulock, Harvey L. Tedrow, Joseph M. Viener, and Ira L. Wright.


*Wanted*

One used 512 Goodman Undercutter 50 H.P., 440 volts A. C., 3 Ph., 60 Cy., preferably with a bug duster and carriage. Do not need the cutter bar, chain, bits or trailing cable. Condition must be very good.

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## Safety Note

New mantrip cars used by Jones & Laughlin Steel Corp. at its Vesta mines division have been equipped with special first aid outfits. Thus each mantrip car can serve in an emergency to treat the immediate needs of injured men and as a potential ambulance to remove men from the mine.

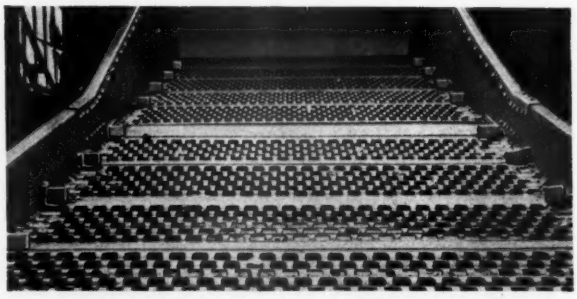

# HENDRICK SCREENS
## *help to speed production*

**To help the coal industry in speeding production, Hendrick furnishes a wide line of Flanged-Lip Screens, Wedge-Slot Screens, Vibrating and Shaking Screens, and also Elevator Buckets, Flights, Shaker Conveyor Troughs and Ball Frames.**

***Hendrick Flanged-Lip Screens,*** **for screening and dewatering coal, are furnished with short, medium or long slots, in 148 different standard slot sizes. The staggered slots, tapered in the direction of the flow are practically non-clogging.**

***Hendrick Wedge-Slot Dewatering and Dryer Screens*** **are constructed with varied types of profile bars, designed expressly for specific applications. The accurately spaced slots extend uninterruptedly the entire length of the screen.**

***Hendrick Perforated Plate*** **for vibrating and shaking screens retains uniformity of mesh throughout long service life. Many coal preparation plants find Hendrick perforated stainless steel especially desirable for dewatering and desanding operations.**



***Hendrick Shaker Conveyor Troughs,*** **of high carbon steel offer maximum resistance to abrasion, and to bending, breaking or buckling.**

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"Shur-Site" Treads and
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## Zinc Institute Program

On April 11 and 12 the American Zinc Institute held its annual meeting at St. Louis, Mo. On Tuesday morning Dr. James Boyd, director, U. S. Bureau of Mines, addressed the group on "The Domestic Mining Outlook." Howard I. Young, president of the American Mining Congress and president, American Zinc, Lead & Smelting Co., discussed "The Domestic Zinc Outlook" from both the slab zinc and zinc concentrate angle. Dr. Joseph Zimmerman, editor-in-chief of the *Daily Metal Reporter*, gave a résumé of "The Business Outlook for Metals."

Zinc products were discussed by a series of able speakers on Tuesday afternoon. Wednesday morning, R. L. Wilcox, chief of the nonferrous metals branch of the ECA, discussed the current world zinc situation. Other nationally known figures of the zinc industry discussed pertinent topics of current importance.

## Holy Terror to Reopen

At Rapid City, S. D., an official of the Holy Terror Mine, recently announced that the mine will soon be reopened. It was shut down in 1942 as a wartime measure. George E. Flavin, secretary-treasurer of the company, said the 56-year-old mine, situated at Keystone has produced more than $5,000,000. The decision to open the mine followed a conference between William P. Lane, governor of Maryland and president of the Holy Terror, and Mr. Flavin. The two men are majority owners. About 50 men will be employed during the next few months unwatering and repairing the mine. Initial production is expected to boost employment to more than 100 men.

## Great Northern Ships Less Ore

Shipments of iron ore from the mines of the Great Northern Iron Ore Properties during 1949 totaled 7,426,000 tons, compared with 10,550,000 tons in 1948, according to the annual report of the trustees. The consolidated distributable income for 1949, before charges for depletion and leaseholds were disposed of, was $2,255,448, compared with $2,861,258 for 1948. The report showed that during 1949 iron ore shipments from the Lake Superior district totaled 70,900,000 tons. Of this amount 57,000,000 were shipped from Minnesota, and of this 53,500,000 tons came from the Mesabi range. These figures compare with 1948 shipments of 84,700,000 tons from the district, 69,100,000 tons from Minnesota, and 64,000,000 tons from the Mesabi range.

Since its formation in 1906 the Great Northern Iron Ore Properties has shipped a total of 325,411,432 tons of iron ore. Trustees of the company, with general offices in St. Paul, hold all the stock of the Arthur Iron Mining Co., Grant Iron Mining Co., Polk Iron Mining Co., and the Minnesota Colonization Co., and nearly all the stock of the North Star Iron Co. of West Virginia and its subsidiary, the Mesabi Range Townsite Company.

## Bristol Mine to Ship in 1950

Two years ago the Inland Steel Co. began unwatering the Bristol mine at Crystal Falls, Mich. Recently, arrangement was concluded with the Oliver Iron Mining Co. whereby the Inland Steel Co. will lease Oliver's Youngstown mine adjoining the Bristol. Prior to shutdown in 1933, the two mines operated jointly through the Bristol shaft.

Hoisting of ore is now under way and the mine will be added to the list of shipping properties in 1950.

## Danube Mine Installs Conveyor

At its Danube mine on the Mesabi iron range of Minnesota, Pickands Mather & Co. is installing a belt conveyor system that will be nearly 1100 ft long. The 30-in. belt is designed to travel at the rate of about 585 fpm to move 900 long tons of iron ore per hour. The installation has a vertical lift of 210 ft. In conjunction with the belt, primary crushing will be done in the pit and crushed iron ore will be delivered by the belt to a 200-ton transfer pocket on the surface. Railroad equipment will move the ore from the pocket to the Danube concentrating plant located three miles away.

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These extra rugged tools are compactly built for mounting on any kind of mobile platform. They're equipped with finger-tip controls and plenty of power for boring 4, 6 and 8-inch blast holes through shale, sandrock and soft limestones. Four special individual leveling jacks make setups easier.

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The Parmanco Two-Speed Transmission Drill is designed to meet the requirements of the general prospecting field where it is not necessary to drill in solid limestone. Special sliding frame permits drilling and pulling of augers without moving drill. New design of chuck eliminates all hand operation in raising power plant. Recommended for 50 to 60 feet with four and one-quarter inch equipment. Under favorable conditions it is being used to greater depths and can be used with six inch equipment.

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## Gallium Uses Sought

Scientists at the Eagle-Picher laboratories are looking for a major use for gallium produced as a by-product of lead and zinc in the Tri-State area of Missouri, Kansas and Oklahoma. At present, a price of $1300 per pound is quoted on gallium.

Experimental work on potential uses is being conducted by the Navy at Bethesda, Md. A radioactive isotopic form of the gallium salts has been injected into test animals and autoradiographs made of the animal bones. These show that the material enters and concentrates within growth areas of bones. In the meantime other uses are sought for this rare metal that melts at 85 F and boils at 3500 F.

## American Engineers to Develop Turkish Coal

Six members of an American mining engineering team are now in Turkey to assist government agencies there in the $45,000,000 ECA development and mechanization of the Zonguldak coal field. The party, composed of members of the staff of the Paul Weir Co., Chicago, will serve as advisers and consultants to the Turkish operating organization.

Included in the teams are mining, electrical, civil and mechanical engineers—all specialists in design and construction of systems for increasing mine productivity and improving the quality of output. Chief of the party is Lee O. Richards, vice-president in charge of foreign operations of the Weir company. Other members of the party are James Beeley, assistant chief; John E. Good, mining engineer; John S. Lambright, civil engineer; David Renshaw, electrical engineer; and Charles R. Weir, business manager.

## Oliver Iron Builds Agglomeration Plant

At Virginia, Minn., construction has been started on a new type agglomeration plant for processing taconites and fine ores. Details of the project were disclosed in March by R. T. Elstad, president of Oliver Iron Mining Co. "This major experiment," Mr. Elstad stated, "is one of the bold and costly steps in a $17,000,000-$20,000,000 program to secure basic information before building permanent commercial taconite plants." Five major stages are included in the program covering exploration, research, mining, separation and agglomeration of fine material.

The new plant, with a capacity of approximately 1,000,000 tons annually, will be the first combination sintering and nodulizing plant on the Mesabi range.

In the operation of the plant, which

will be built adjacent to the present Rouchleau crushing and screening plant, fines will be separated from the coarser material by a vibrating screen and then carried by conveyor belt to storage bins at the nodulizing and sintering plant. The coarse product will be loaded for shipment and the fines will proceed to either the sintering machine or nodulizing kiln and will be agglomerated into egg-sized lumps for blast furnace use. Full time operation of the plant will require approximately 50,000 tons of coke, 35,000 tons of coal and 35,000 tons of limestone annually.

## West Mesabi Taconite Program

The western end of the Mesabi iron range will not be bypassed in development of taconite, an audience at Hibbing, Minn. was recently informed. W. K. Montague of Duluth, attorney for a number of mining companies, said one of the firms he represents expects to build one of its two taconite plants at Hibbing. E. W. Davis, director of the School of Mines at the University of Minnesota, said he "didn't think" the whole development is to be concentrated on the east end of the range. Mr. Davis added that development costs for Labrador and Venezuela ores will be about the same as for domestic taconite.

## Marquette Range Elects Officers

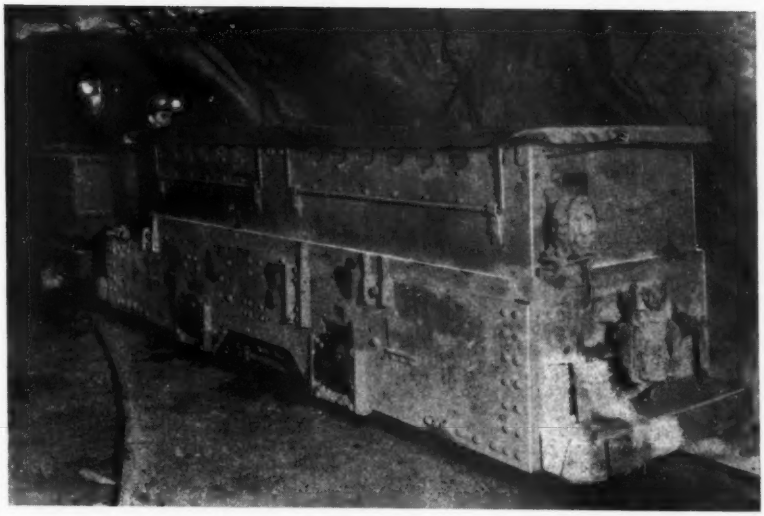
At its February meeting, the Marquette Range Engineers Club elected the following officers for 1950; A. J. Guscatt, president; P. P. Ribotto, vice-president; H. R. Anderson, treasurer; G. T. Hollett, secretary; and R. W. Braund, J. S. Westwater and S. Thorvaldson as directors.

## Potential Iron Ore Reported

The second major new find resulting from Minnesota's big aerial magnetometer survey in 1947 was recently disclosed by Dr. G. H. Schwartz, director of the Minnesota State Geological Survey. The find consists of an 80-mile long belt of potential iron ore stretching across southeastern Becker and northern Otter Tail counties. The zone is broken into two connected areas, each shaped like a gigantic horseshoe, opened to the east. The findings tie in with those announced in the first report of the State and Federal geological survey's released in 1947.

One of the horseshoes, about 50 miles long, lies in an area in Otter Tail county that was explored by engineers in 1910. They reported encountering iron-bearing rock formation 350 ft underground, while conducting exploratory core-drilling operations. The core indicated the formation to be 125 ft thick.





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**EDISON**


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## Manganese Project

Manganese production on a major scale is planned to begin this year near Henderson, Nev. Manganese, Inc., plans construction of a plant at an estimated cost of $750,000 at the Three Kids manganese property northeast of Henderson, and Combined Metals Reduction Co. has announced that it will build a concentrator at the Basic Magnesium plant to recover manganese from ore developed in its Pioche lead-silver-zinc mines.

Credited with containing 5,000,000 tons of ore averaging 18-25 percent manganese, the Three Kids mine and plant were purchased last fall from the State of Nevada by Manganese, Inc., for $250,000 payable over a period of years. Nevada acquired the properties from the War Assets Administration early in 1949. It is understood that Manganese, Inc., intends to use a recovery process developed by the U. S. Bureau of Mines, that is expected to extract at least 65 percent of the manganese.

## Monarch Resumes Work

After many years of inactivity the Monarch gold mine near Sierra City, Calif., recently rehabilitated by the Sierra Monarch Mining Co., is scheduled to go into substantial production early this year. Three hydroelectric engines have been installed to generate 500 hp and construction of a mill designed to treat 100 tons of ore daily is progressing. Underground workings have been reconditioned and the five-stamp mill has been operated several months on cleanup ore. Development work has been resumed and mining is proceeding on main levels.

## Dauntless Tunnel

The Leadville Lead Corp. has announced discovery of lead and silver ore reserves in the Horseshoe District near Fairplay, Colo. The company said it will complete the Dauntless tunnel to the Leadville side of the Mosquito range to provide an outlet for the ore. Clio L. Kem, president of the firm, said the tunnel will emerge six miles from the American Smelting & Refining Co. smelter at Leadville to eliminate an 85-mile haul.

The tunnel, which will cost from $150,000 to $200,000, will be driven by the Harry L. Sinclair Co., Denver, in return for a royalty on the ore. Completion of the project is expected about May 1951.

## Bonanza Lead Discovery

Recent development in the Bonanza Lead Mine, 14 miles north of Colville, Wash., is reported to have uncovered a blanket of solid ore, 27 ft thick. Concentrates from this newly-discovered ore body are running 75.5 percent lead and 12.4 oz of silver per ton. According to Norman Lindsley, chief engineer of Bonanza Lead. "The ore body lies approximately 300 ft south of the ore uncovered a year ago, and is on a continuation along the same anticline. Beyond question it is the most important recent development in northeastern Washington." It is planned to immediately start construction of a 500-ton sink and float and flotation mill. The decision to build the mill is a result of the new ore body combined with the expansion of the Bonanza Lead mine, as well as favorable showings at the Old Dominion mine, seven mlies east of Colville, which the company acquired last year and has been developing continuously since. The selected site is centrally located between the two properties. Within a short time there is expected to be completed at Bonanza Lead, a 1400-ft haulage crosscut, on the 600-ft level, with consequent speeding up of ore extraction and haulage. Sixty-five men are employed at the two properties, and the annual payroll is approximately $200,000. Two partners, Earle B. Gibbs and Ira M. Hunley, are owners of the firm operating the two mines.

## Getchell Mine Plans Ahead

Directors of Getchell Mine, Inc. recently reported that all officers of the company had been reelected and that prospects indicate 1950 will be a "good one" for the Humboldt county, Nev., operation. The directors reported that mill construction is virtually completed, that will make it possible to treat 1500 tons of oxide ore a day. According to a report of George Wingfield, president, a metallurgical process installed last year will remove refractory materials and prepare the ore for cyanidation. He said development work has proceeded with favorable results at the mine during the last two or three years with the Getchell vein now opened up for a length of more than 8000 ft with widths up to 400 ft. Most of the ore to be milled will be taken from the open pit with addition of some ore from underground workings. Considerable work is being done underground at the 600-ft level in the north part of the mine, where new ore bodies have been found. To increase water supply another well has been drilled nearer the mill.

Getchell Mine continues milling oxide ore at the rate of 350-400 tons per day, including some custom product from nearby gold and gold-silver properties. Reelected officials are George Wingfield, president; Noble Getchell, vice-president and general manager; Tom Wilcox, secretary-treasurer and Roy Hardy, consulting engineer in charge.

## Idaho Nuclear Reactor

The U. S. Atomic Energy Commission recently announced that the Bechtel Corp. of San Francisco has been selected to perform major construction work on the first reactor to be built at the new Nuclear Reactor Testing Station near Arco, Idaho. This will be an experimental breeder reactor designed to test the feasibility of transmuting non-fissionable uranium into fissionable plutonium in a process that produces more fissionable material than it consumes. Work is expected to be completed by the end of 1950.

A materials testing reactor will be located at this testing station. This will be designed to provide information on the behavior of materials under severe radiation conditions.

## California Asbestos

Production of asbestos from the deposits in the Highland Lake region of Shasta and Trinity Counties in California is scheduled to start soon. N. J. Lockhart and associates are installing a plant where the crude material will be crushed in a hammer mill and asbestos fiber separated by air jets. The processed product will be shipped to California manufacturers of asbestos materials.

## Goldacres Open Pit

The Goldacres property of the Consolidated Goldacres Co., in the Tenabo district of Nevada between Austin and Beowawe, has become one of the state's leading gold producers. Ore averaging approximately $7 a ton is mined by power shovels in open cuts. The cyanide mill handles 350 tons daily. Value of the monthly output is reported to exceed $60,000. The property was developed from a desert prospect into an important mine before the war.

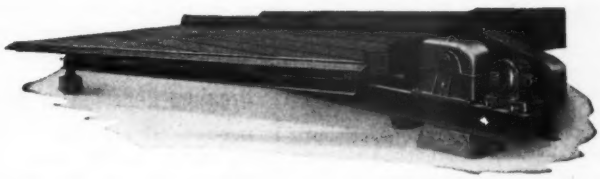
Extensive diamond drilling has indicated that enough ore is available for 15 years' operation at the present rate of mining. Power shovels handle 650 tons daily of ore and waste. As depth is gained it is becoming necessary to remove increasing amounts of overburden. Goldacres is controlled and operated by London Extension, Ltd., a British corporation.

## Kearney Mine Reopened

The Peru Mining Co. has reopened its Kearney mine at Hanover, N. M., and is again producing zinc ore. The Kearney was closed June 18, 1949. Joseph H. Taylor, vice-president and general manager has stated that a crew of 90 men will be employed at the mine, and that 20 additional workers will be used at the mill at Deming. The Kearney was closed when the market price for zinc dropped to 9c and profitable production was no longer possible. The reopening was made possible, Taylor said, when a group of miners offered to go back to work at lower wages. He said that the pay will be raised when the price of zinc increases.

## Copper Queen Production

Copper production probably will be resumed at the Copper Queen Branch, Phelps Dodge Corp., Bisbee, Ariz., before June, and lead and zinc mining at that property will come to an end shortly. The corporation's plans were announced by Cleveland E. Dodge, vice-president, during an Arizona visit. He reported that the present plan is to have copper production from the Bisbee property available at the time the Ajo smelter begins the treatment of the Ajo concentrates now going to the Douglas smelter. He also indicated that the leaching of copper ores at the company's property at Nacozari, Sonora, Mexico, will be resumed in the near future.

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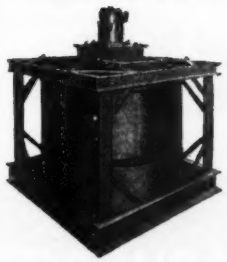

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## Prospector's Institute

Over a period of two months, seven evenings are being devoted to a Prospector's Institute, sponsored by the Mining Association of the Southwest at Los Angeles. The object of these meetings is to provide interested persons with the basic knowledge required to fit them for ore search.

The first meeting was held on March 16 and the concluding session will be held on April 27. Included in the comprehensive program are such topics as the technique for prospecting for metal and nonmetallic minerals, helpful hints on prospecting, mining law, scientific advances in prospecting and the mineral occurrences of California.

## Elkhorn Mining Company

Elkhorn Mining Co. has resumed operations at its Elkhorn district silver-lead property near Boulder, Mont. The action follows the termination of a two-year operational agreement between Elkhorn and the Associated Mines Development Co. of Oregon. Initial work is being started in the Sophia shaft workings at a point 200 ft below the surface, on a new and recently discovered ore body found in the footwall, and not previously encountered in earlier operations. Geological conditions indicate that the new ore bodies should parallel to depth the original Elkhorn ore mined through early day operations to the 2300-ft level. The Elkhorn Mining Co. owns the Free Enterprise group which is being operated as a silver-uranium mine by an operational agreement with Sunshine Mining Co. of Kellogg, Idaho.

## Philippine Gold Sales Ban Eased

After banning export of gold early in January, the Philippine Government recently announced that gold mines may sell 75 percent of their production on the open market. When the ban was placed, gold was selling on the open market as high as $57.50 per ounce. Under the present regulation, only 25 percent of the output is required to be sold at the official price of $35 per ounce.

## Uranium Reported in Wyoming

Deposits of uranium, thorium and rare earths oxides, have been reported found in the Bear Lodge mountains of the Black Hills National Forest, seven miles north of Sundance, Wyo. The discovery was announced by A. J. Katches, Duluth, Minn., mining engineer, who said he made the discovery last August.

Tests on small deposits of ore from Sundance have been reported to reveal small amounts of uranium and thorium, cerium, lanthanum and other rare earths. The AEC in Washington has stated it will examine the deposit.

Plans are in the making for the formation of a company of midwestern businessmen, represented by Morris Mantell, president of the Talmor Engineering Co. of Chicago. He has confirmed that he and his associates have taken leases on several hundreds of acres near the original find.

## Gold Crown Development

With the installation of equipment, development work is going on at the Gold Crown group of eight claims, adjoining the Sixteen-to-One, El Dorado and Rainbow mines, and controlled by Gold Crown Mining Corp. The properties are located near Allegheny, Calif. The 78-ft shaft of the Wonder No. 2 claim has been reconditioned, a tunnel driven 100 ft, and arrangements made for deeper work. The Sixteen-to-One property continues to be operated at capacity, with 56 men employed and the mill treating 100 tons a day. Mining of gold quartz veins is reported to be proceeding in main workings, and profitable ore is said to


*A thousand and one*

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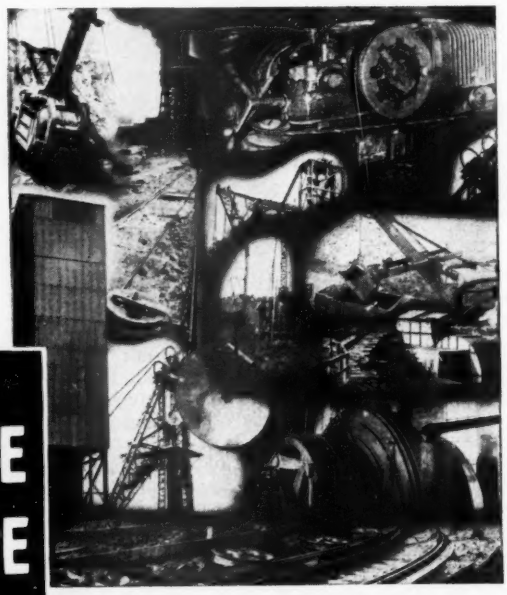

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have recently exposed in the Gold Crown claim. The property is operated by the Sixteen-to-One Gold Mining Co.

## Gold Queen Plans Operations

Installation of equipment is planned soon at the Golden Queen group of 14 placer claims in the Sylvania district of Nevada, leased by Dodge Construction Co., for ten years. Major scale operations next summer are projected if an ample water supply can be obtained. The deposits are said to range from 4 to 20 ft in depth, with drill holes indicating that gravel at the upper end of the property averages $1.50 per cu yd.

## Marysvale AEC Depot

Plans for facilities to purchase and stockpile uranium ores found in the Marysvale area of Utah have been announced by the Atomic Energy Commission. Autunite and torbernite type uranium ores will be purchased under contractural agreements to be negotiated with individual producers. Agreements with producers will provide for the price, minimum grade of acceptable ore, maximum tonnage which may be delivered and the period of the agreement. The initial purchase program will be for ores expected to average at least 0.30 percent $U_3O_8$ and containing not less than 0.20 percent $U_3O_8$.


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## Stag Canyon Shutdown

Phelps Dodge Corp. has announced that it will close its Stag Canyon Branch at Dawson, N. M., April 30. The mine is one of two large coal mining operations now active in New Mexico. No explanation for the shutdown was given.

## Alaskan Miners Elect Officers

At the annual election of the Alaska Miners' Association, Charles F. Herbert was unanimously chosen to serve as president for 1950. Mr. Herbert is a partner in the Wade Creek Dredging Co. and the Yukon Placer Mining Co. Vice-presidents elected to serve for the same term were R. E. Wyer, Cleary Hill Mines; Fred K. Dent, Counselor Dredging Co.; Harold Strandberg, Strandberg & Sons; and J. A. Williams of the Alaska Juneau Gold Mining Co. Al Anderson of the Goodnews Bay Mining Co., was renamed executive secretary of the association.

## Wickenburg Market Leased

Robert Willoughby of Tiger, Ariz., has leased the Wickenburg Ore Market at Wickenburg, Ariz., from John C. Herr. Herr is moving to California. The Wickenburg Ore Market is one of the few plants which deals in less than carload lots.

## Wheels of Government

(*Continued from page* 80)

similar to those included in other types of patents.

Mining men in general view with considerable concern any proposal to alter these laws, which have served so well for so many years. It is widely felt that many of the difficulties which have arisen could be remedied by prompt and more sympathetic administration on the part of Federal departmental representatives. Charles F. Willis, chairman of NMAC's Public Lands Committee, has declared that once the subject of revising the mining laws is open for debate, "those desiring a revision of the laws will go much farther and will introduce changes far beyond those agreed upon" to the detriment of the industry. Willis is now receiving comments as to the feasibility and acceptability of the Bureau's proposals.


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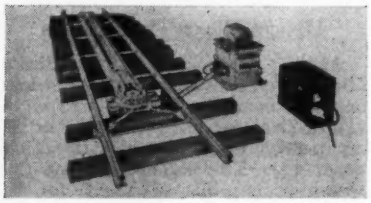
# Manufacturers Forum

## Portable Car Feeder

The Nolan Co., Bowerston, Ohio, has announced a portable feeding unit for mine cars known as the Porta-Feeder. With the unit mounted between the



rails on top of the track ties, automatic reciprocating pushing dogs deliver constant forward feeding motion. Light weight and freedom from permanent-type anchorage are featured in the Porta-Feeder.

## Magnetic Iron Separation

An improved type magnetic separator, to aid in concentrating low grade iron ore from the Mesabi Range of Minnesota, has been developed by Jeffrey Manufacturing Co. with magnetic design assistance from the Westinghouse Electric Corp. Phelan McShane, consulting mining engineer for Westinghouse, disclosed that the new separator consists of a rotating drum mounted in a pulp box of special design. Stationary magnets inside the drum provide the means whereby iron ore is extracted from the taconite.

"As the mixture passes beneath the separator's rotating stainless steel drum," Mr. McShane explained, "the magnets draw the magnetic iron ore from the mixture to the drum. The movement of the drum carries the ore through a washing zone and then away from the direct pull of the magnets, depositing it in a trough leading to further grinding stages."

Stage grinding is called for in the magnetic separation process with the partially ground ore passing through the separator between each grinding stage. Another type of Jeffrey magnetic separator is used to make a final separation of the iron mineral. The final product is dewatered and nodulized.

The system is already in operation at the Aurora, Minn., plant of the Erie Mining Co. The nodules produced contain about 64 percent iron, several percent higher than the high grade ores now used in blast furnaces. Nodules are being produced at the Aurora plant at the rate of 200,000 tons a year.

## Pocket Magnifier

An improved 10 power hastings Triplet pocket magnifier designed for rough field and underground usage is available from the Stratex Instrument Co., Los Angeles. The lens elements are mounted in a stainless steel frame provided with a heavy ring for attachment to prevent loss.

## Twist Drills for Stone and Masonry

Kennametal Inc., Latrobe, Pa., has announced availability of a twist-type masonry drill with a tungsten carbide insert. The new drill is designed with an "angled" cutting point and a "faster" spiral for which the manufacturer claims greater biting power and removal of dust at an accelerated rate. The drills fit standard rotary electric drills and may be obtained in 12 sizes from ¼ in. through 1 in.

## Combination Shovel

A new one cubic yard machine, the 43-M, has been announced by the

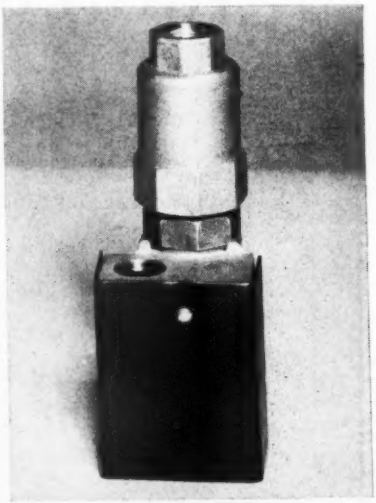
Marion Power Shovel Co., Marion, Ohio. With various front-end combinations, the unit is designed to serve as a shovel, dragline, clamshell, crane, backhoe or pile driver. Versatility of the machine fits it for a wide range of application in coal and metal mining and in construction work.

## Sectional Conveyor

Hewitt-Robins Inc. reports production of a sectional conveyor that can be shipped as a package and installed in the field without the help of trained technicians in about one-fourth the time required for erecting a conventional conveyor. The sectional conveyor is available in truss sections of 6½ ft, 15½ ft, 18½ ft, 21½ ft and 24 ft in length.

## Water Operated Control

A new control device that responds to a flow of cold water to open or close an electrical contact has been announced by the control division of the General Electric Co. The device is called a flow interlock. In operation it closes a contact when a flow of water exceeds a present



amount and opens it when the flow falls below this amount. The flow is adjustable in the 1-4-gpm range.

## Speedy Chain Hoist

A new chain-type electric hoist produced by the Yale & Towne Mfg. Co., is said to lift at speeds up to 41 fpm, include a lower as well as an upper limit stop and have a wide "pick-up" angle. The hoist is available in load capacities of 500, 1000 and 1500 lb.

## U. S. Coal Preparation Equipment Goes Abroad

Heavy-Media preparation plants, designed and supplied by Nelson L. Davis Co., Chicago, will soon be in operation at two French Mines: Houilleres de Nord et-de-Pas-de-Calais, Douai, France and Regie des Mines de la Sare, Camphausen Mine, Sarre, France.

At the Douai installation a unit will handle 100 tons of coal per hour; at the Camphausen mine, the washery is custom-built and the output will be 560 tons per hour.

## Molybdenum Lubricant

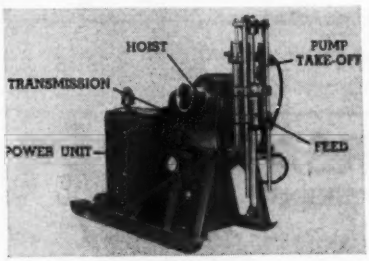
Molybdenum has been used to supplement lubricants to form a product called "Liqui-Moly" developed by the Lubricants Division of The Lockrey Co., College Point 1, N. Y. Superior lubricating qualities are claimed. The molybdenum lubricant is said to be unchanged by extremes of temperature and to provide a permanent friction-supporting film which cannot be "squeezed out" by any amount of pressure.

## Diesel Maintenance Training

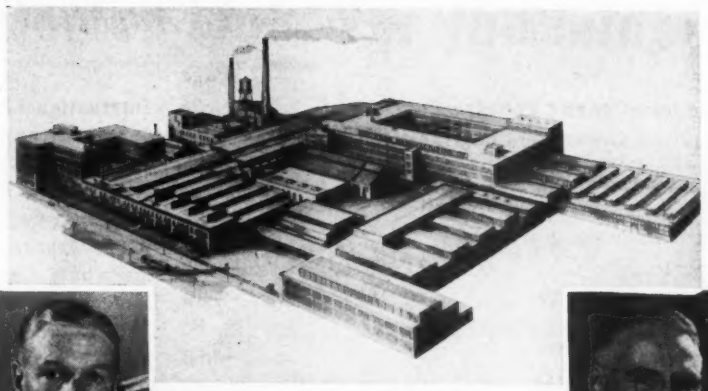
Free training courses on Diesel-powered trucks and buses are being offered by the Mack Truck Co. to answer mounting needs for trained Diesel mechanics. The training courses will be established in over 60 cities to develop competent mechanics. All persons employed in any capacity allied to the maintenance or operation of trucks and buses are qualified for the course. The ten-week courses comprise a two-hour session, one evening a week.

## Portable Core Drill

A core drill named the "Teredo" has been designed by the Acker Drill Co., Inc., Scranton, Pa., to fill the need for a light, compact, portable




core drill for depths to 600 ft. The Teredo drill offers a three speed transmission with either hydraulic or screw-feed drill head. The unit is adaptable to a variety of power plants. High drilling speed is claimed for the machine by use of 24-in. drill travel.



**Goodman Celebrates 50th Anniversary With William E. Goodman, President (left), and Howard Goodman as Executive Vice-President**

On April 23 the Goodman Manufacturing Co., Chicago, Ill., celebrated its 50th year of building mining machinery. In 1889 Herbert E. Goodman first entered the mining machinery business and in 1900 he formed the present company.

Breast-type coal cutters lead the Goodman line in 1900. It was, perhaps, the most successful of the early electric chain-type cutting machines in competition with the compressed air puncher-type coal cutters.

In 1910, Goodman introduced its first shortwall, a machine in which motor power could be used to transport the unit, unload it from its truck, maneuver on the mine floor, sump, cut and reload. By 1915 the company had brought out a mounted cutter with even greater capacity.

Haulage-type electric locomotives were also included in the original line of equipment. Soon several sizes of locomotives equipped with electric cable reels were introduced. Storage-battery locomotives were added in 1915. Today the company offers a well diversified line of locomotives in several designs for both coal and metal mines. Loading equipment built today includes machines for working coal mines and tunnels. A full line of conveyors—shaker, belt and chain types is also featured.

From the original plant consisting of a combined factory and office, a blacksmith shop and a power house, the plant has grown to include some 25 buildings covering 16 acres. William E. Goodman, son of the founder, is president. Another son, Howard Goodman, is executive vice-president in charge of production.

## — *Announcements* —

**A. M. Boehm** has been appointed eastern manager of the Engine Division of **Worthington Pump and Machinery Corp.**

**Tom Bono** has been appointed sales representative in the Middle Atlantic territory for the **Rock Bit Sales & Service Co.**

**C. L. Brosseau** has been named manager of the **Mack-International Motor Truck Corp.'s** St. Paul branch. **Pierce J. Fleming** has been appointed manager of the company's off-highway sales division and **John Walker** has been named manager of the off-highway sales engineering division.

**T. R. Farley**, vice-president of **Caterpillar Tractor Co.**, has been named general manager of the company's new plant to be located two miles southwest of Joliet, Ill. There the company has begun construction of a plant on a 300-acre tract. The new factory will produce a large portion of the company's extensive line of bulldozers, scrapers, wagons and rippers.

**Link-Belt Co.** has announced opening of a factory branch store and warehouse in Kansas City, Mo.

The **Reliance Electric & Engineering Co.** has opened a new sales office in Charleston, W. Va., with **William C. McConnell** as branch manager.

**Richard S. Wharton**, formerly vice-president in charge of sales for the Quaker Rubber Corp., has joined **Hewitt-Robins Incorporated** as sales manager of the Hewitt Rubber Division.

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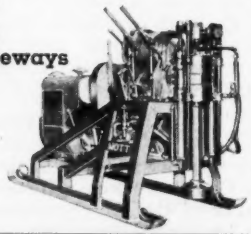

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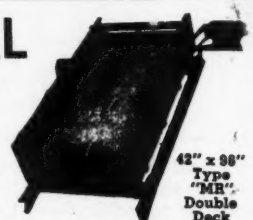

42" x 96" Type "MR" Double Deck

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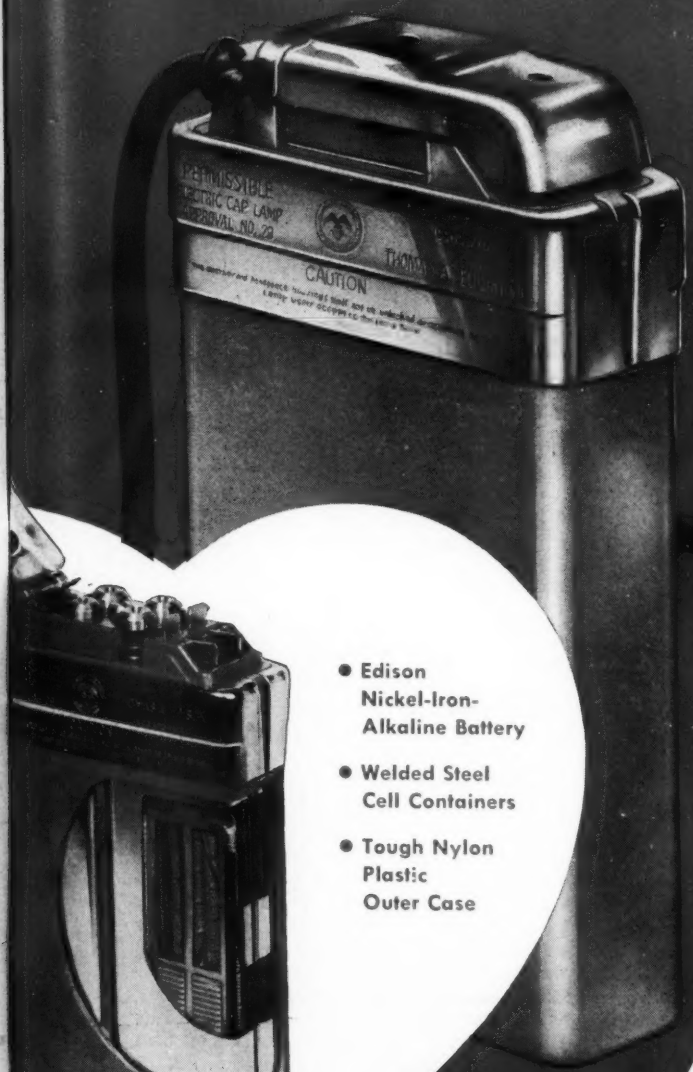
RACINE, WISCONSIN

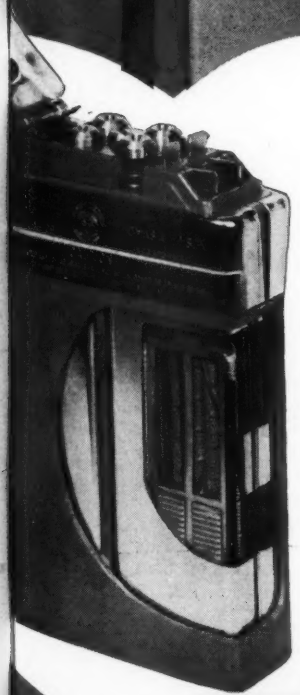
# ...the heart of Better Light for the miner

THE FAMOUS *Edison* BATTERY




The unfailing dependability of the Edison Electric Cap Lamp battery has been recognized since its introduction to the mining industry thirty-five years ago. Today, the Edison nickel-iron-alkaline battery continues to lead in every detail of construction and performance.

*More light* than ever before obtainable in a miner's lamp is a feature of the new Edison R-4 Battery. Cased in tough nylon plastic, with outer parts of stainless steel, the R-4 Battery is armored against rough usage. It is compact, well-balanced and easy to wear. *May we arrange an underground demonstration?*



- Edison Nickel-Iron-Alkaline Battery
- Welded Steel Cell Containers
- Tough Nylon Plastic Outer Case

- Two-Filament Bulb
- Positive "Spot" Adjustment

**EDISON MODEL R-4 ELECTRIC CAP LAMP**

APPROVED BY U. S. BUREAU OF MINES

**MINE SAFETY APPLIANCES COMPANY**

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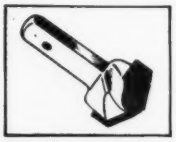
## New Bit Rotary Drills Bolt Holes in Medium Hard Roof . . .

### Savings of Thousands Of Dollars Predicted



Development of a rotary bit for rock and laminated sandstone has been announced. The bit (FD Series) is used in coal drills.

Commenting on the bit, Curtis F. Rivers, Gen. Supt., Tennessee Product and Chemical Corp., Whitwell, Tennessee, predicted that it would save coal operators thousands of dollars. A Kennametal cemented carbide cutting edge resists shock and impact, and its shape makes it ideal for starting.

The operation shows the bit being powered by a Jeffrey A-7 Drill. A special alloy steel drill rod is used.

Write for Bulletin M-105. Kennametal Inc., Latrobe, Pa.

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## 30% Less Power Required To Cut Coal, Reports Claude Matthews, Supt., Moore Coal Co.

Tests made by a West Virginia engineering concern show that Kennametal U-5-H Machine Bits consume 30 per cent less power than conventional steel bits. The power comparison was made at the Moore Coal Company.

Mr. Claude Matthews, Supt., said that an Esterline Angus watt-hour meter showed that steel bits placed 105% of rated load on the motor and that Kennametal bits required only 75% of rated load. The horsepower consumption was 52 against 37.

Write for Bulletin M-115. Kennametal Inc., Latrobe, Pa.

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## Bit Developed for Shale, Slate, and Boney Roof Drilling

A special bit for rotary drilling roof bolt holes in shale, slate, and boney has been developed. The bit, (RD Series) is a modification of the conventional coal bit. It is stubbier and stronger.

Write for Bulletin M-105. Kennametal Inc., Latrobe, Pa.

# Drill Sandstone

## Better, at Less Cost—with Kennametal Rock Bits

**Operators get up to 75% faster drilling, over 100 times longer bit life. *Examples are:***

| LOCATION | | FOOTAGE | | Ratio of Bit Life | % Increase in Speed |
|---|---|---|---|---|---|
| County | State | Steel | Kennametal | | |
| Cambria | Pa. | 1.1' | 198' | 180 to 1 | 75% |
| Monongalia | W. Va. | 8.0' | 1336' | 167 to 1 | 33% |
| Westmoreland | Pa. | 1.2' | 254' | 212 to 1 | 42% |
| Raleigh | W. Va. | 6.8' | 1305' | 192 to 1 | 46% |
| Average life and speed increases on these four typical operations: | | | → | 188 to 1 | 49% |

You get better bolt holes with Kennametal cemented carbide rock bits, because hole gage is uniform—the whole length. Bolts have better anchorage and make safer, more secure jobs. Drilling speeds are increased because Kennametal cemented hard carbide rock bits have high resistance to wear, stay sharp and on the job far longer.

Performance clearly shows that first cost is of slight consideration and that bit cost is from 50 per cent to 20 per cent less under average drilling conditions. In addition to lower bit cost consider other advantages such as speed, handling time and bit changing.

Your Kennametal representative is an experienced mining man—ready to demonstrate to you how Kennametal rock bits can give you savings that are really outstanding. Contact him or write—Mining Division, Kennametal Inc., Latrobe, Pa.

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*Write us for any information you want on Cutting or Drilling*